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WORKING PLAN
FOR
THE COIMBATORE SOUTH DIVISION
From 1st April 1965 to 31st March 1975

By

Thiru J. WILSON
Working Plan Officer

under the direction of the
CHIEF CONSERVATOR OF FORESTS, MADRAS

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GOVERNMENT OF TAMIL NADU
1973

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TRUTH ALONE TRIUMPHS

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PREFACE.

The last working plan for the Coimbatore South Forest Division was prepared by Sri K. A. Bhoja Shetty. This plan was in force from 1st April 1954. Although this plan was drawn up for a period of 15 years, its earlier revision was necessitated due to various reasons. Following 'States Reorganisation' in 1956, the Thekkadi leased forests were transferred to the Kerala State necessitating deletion of the Deciduous Selection Working Circle and large deviations to some of the other major working circles. This was followed by the advent of the Parambikulam-Aliyar Project in 1958, resulting in further diminution in the total forest areas of the division. Vast areas of valuable forests had to be alienated to the Public Works Department and the State Electricity Board necessitating a complete revision of maps apart from the need to frame fresh proposals to make up for the forest wealth thus lost. The ushering in of the Development Schemes under the Second and Third Five-Year Plans also brought in more deviations to the working plan as more areas were converted into plantations of valuable species.

The working plan division to prepare this plan was formed on 12th July 1962. The writer commenced reconnoitring the forests of the division soon after assuming charge and submitted the reconnaissance report on 17th November 1962. The proposals contained in this report were approved by the Chief Conservator of Forests, Madras, with certain modifications after a regular discussion was held at Coimbatore on 21st December 1962 in which the Chief Conservator of Forests, the Conservators of Forests, Salem and Coimbatore Circles, the District Forest Officer, Coimbatore South Division, the Personal Assistant (Development) to the Chief Conservator of Forests and District Forest Officers who held charge of the division in the past, participated. This working plan has been prepared in accordance with the proposals thus approved by the Chief Conservator of Forests.

Since the metric system has been fully introduced, only metric units are quoted in the plan. However, since all the available maps are drawn according to the F.P.S. system, computation of areas had to be done as per the old system, but only their metric equivalents are quoted in the text.

In the preparation of this plan, the forests of the entire division have been divided into permanent blocks and compartments for purposes of management, description, location and record of works, and in order to study the improvement of the forest. Although this is a standard practice in most other States this is an innovation introduced in the preparation of plans in Madras State.

The writer was assisted by a team of two Rangers, six Foresters and one clerk in the field and in the office. The writer wishes to place on record in particular the unflinching co-operation received from Ranger Rangamani and Forester Soosaimanickam. Thanks are also due to Sri C. S. Krishnamurthi, Associate Professor of Plant Pathology, Agricultural College and Research Institute, Coimbatore, for the assistance rendered in conducting the investigations on mortality of Eucalyptus hybrid.

The Coimbatore South Working Plans Division was closed down on 2nd June 1964.

Pollachi,
2nd June 1964.

J. WILSON,
Working Plan Officer.

TABLE OF CONTENTS.

PART I.

Summary of facts on which the proposals are based.

Sections. **Pages.**

CHAPTER I—THE TRACT DEALT WITH.

1.	Name and situation	1
2.	Configuration of the ground	1–2
3.	Geology, rock and soil	2–3
4.	Climate and rainfall	3–6
5.	Water-supply	7
6.	Distribution and area	7–8
7.	State of boundaries	8–9
8.	Legal position	9
9.	Rights and concessions	9

CHAPTER II—THE FOREST.

1.	Composition and condition of the crop	9–21
2.	Injuries to which the crop is liable	21–26
3.	Fauna	26–28

CHAPTER III—UTILIZATION OF THE PRODUCE.

1.	Agricultural customs and wants of the population	28–31
2.	Markets and marketable products	31–33
3.	Lines of export	33–34
4.	Methods of exploitation and their cost	34–42
5.	Past and current prices	42–63

CHAPTER IV—STAFF AND LABOUR SUPPLY.

1.	Staff	64–67
2.	Labour supply	67–73

CHAPTER V—PAST SYSTEMS OF MANAGEMENT.

1.	General history of the forests	74–77
2.	Past systems of management and their results	78–108
3.	Special works of improvement undertaken	108–121
4.	Past yield	121–126
5.	Past revenue and expenditure	127–136

CHAPTER VI—STATISTICS OF GROWTH AND YIELD.

1.	Statistics relating to deciduous timber species	136–142
2.	Statistics relating to evergreen species	142–149
3	Statistics relating to fuelwood	150
4	Miscellaneous statistics	151

PART II.

Future management discussed and prescribed.

SECTIONS. PAGES.

CHAPTER I—BASIS OF PROPOSALS.

1. Objects of management .. 152
2. Methods of treatment to be adopted .. 152
3. Working circles, their area and distribution .. 152–153
4. Blocks and compartments .. 153
5. Period of the working plan .. 153

CHAPTER II—WORKING PLAN FOR THE TEAK PLANTATION WORKING CIRCLE.

1. General constitution of the working circle and character of the vegetation .. 154
2. Blocks and compartments .. 154
3. Division of the area .. 154
4. Analysis and valuation of the crop .. 155
5. Method of treatment .. 156–157
6. Method of executing fellings .. 157–158
7. Tabular statement of fellings .. 158–159
8. Regulation of regeneration operations .. 159–160
9. Nursery .. 160–162
10. Subsidiary silvicultural operations .. 162–166
11. Other regulations .. 166
12. Control .. 166

CHAPTER III—WORKING PLAN FOR THE EVERGREEN SELECTION WORKING CIRCLE.

1. General constitution of the working circle and character of the vegetation. 167
2. Blocks and compartments .. 167
3. Division of the area .. 168
4. Analysis and valuation of the crop .. 168
5. Method of treatment .. 168–171
6. Method of executing fellings .. 171–173
7. Tabular statement of fellings .. 173–174
8. Subsidiary silvicultural operations .. 174–175
9. Other regulations .. 175
10. Control .. 175

SECTIONS. **PAGES.**

CHAPTER IV—WORKING PLAN FOR THE FUEL WORKING CIRCLE.

1. General constitution of the working circle and character of the vegetation. 175–176
2. Blocks and compartments 176
3. Division of the area 176–177
4. Analysis and valuation of the crop 177
5. Method of treatment 177–178
6. Method of executing fellings 178–180
7. Tabular statement of fellings 180–182
8. Regulation of regeneration operations 182–183
9. Nursery 183–184
10. Subsidiary silvicultural operations 184–185
11. Other regulations 185
12. Control 185

CHAPTER V—WORKING PLAN FOR THE EUCALYPTUS HYBRID WORKING CIRCLE.

1. General constitution of the working circle and character of the vegetation. 186
2. Blocks and compartments 186
3. Division of the area 186–187
4. Analysis and valuation of the crop 187
5. Method of treatment 187
6. Method of executing fellings 187–188
7. Tabular statement of fellings 188–189
8. Regulation of regeneration operations 189
9. Nursery 190–191
10. Subsidiary silvicultural operations 191
11. Other regulations 191
12. Control 191

CHAPTER VI—WORKING PLAN FOR THE IRRIGATED TEAK PLANTATION WORKING CIRCLE.

1. General constitution of the working circle and character of the vegetation. 191–192
2. Blocks and compartments 192
3. Division of the area 192
4. Analysis and valuation of the crop 192
5. Method of treatment 192–193
6. Method of executing fellings 193
7. Regulation of regeneration operations 193–194
8. Nursery 195
9. Subsidiary silvicultural operations 195–197
10. Other regulations 197
11. Control 197

SECTIONS. PAGES.

CHAPTER VII—WORKING PLAN FOR THE REHABILITATION WORKING CIRCLE.

1. General constitution of the working circle and character of the vegetation. 197–198
2. Blocks and compartments 198
3. Division of the area 198
4. Analysis and valuation of the crop 198
5. Method of treatment 199
6. Tabular statement of planting 199–200
7. Regulation of regeneration operations 200–203
8. Nursery 203–204
9. Subsidiary silvicultural operations 204
10. Other regulations 204–205
11. Control 205

CHAPTER VIII—WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

1. General constitution of the working circle and character of the vegetation. 205–206
2. Blocks and compartments 206
3. Division of the area 206–208
4. Analysis and valuation of the crop 209
5. Method of treatment 209
6. Method of executing fellings 209–210
7. Tabular statement of fellings 210–215
8. Other regulations 215
9. Control 215

CHAPTER IX—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

1. General constitution of the working circle 216
2. Analysis and valuation of the crop 216
3. Division of the area 217–219
4. Method of treatment 219–221
5. Regulation of regeneration operations 221–223
6. Other regulations 223
7. Control 223

SECTIONS. PAGES.

CHAPTER X—MISCELLANEOUS REGULATIONS.

1. Grazing 223–228
2. Softwood plantations 229
3. Lac cultivation 229
4. Reclamation of areas handed over to the Cinchona Department 229–231
5. Development of the Grass Hills 232–233
6. Planting of fringes of the P.A.P. main canal 233
7. Rehabilitation of areas below the P.A.P. contour canal 233
8. Suggestions regarding jurisdictional changes 234–235
9. Boundaries 236
10. Fire protection 236–238
11. Roads 238
12. Buildings 238–240
13. Rain Guages 240
14. Water-supply 240
15. Forest Tanahs 240
16. Telephone arrangements 240
17. Livestock 241
18. Health 241
19. Wood's grave 241–242
20. Amelioration of hill-tribes 242–244
21. Preservation of wildlife 244–245
22. Control 245–246
23. Plantation and Nursery journals 246–247
24. Compartment histories 247

CHAPTER XI—ESTABLISHMENT AND LABOUR.

1. Establishment 247–248
2. Labour 248

CHAPTER XII—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

1. Financial forecast 249–251
2. Cost of the working plan 251

SUMMARY OF PRESCRIPTIONS 252–265

APPENDICES.

I. Division area statement 266–277
II. List of reserved forests in the Coimbatore South Forest division .. 278–281
III. Rights and concessions admitted in the reserved forests of Coimbatore South Forest Division 282–292
IV. List of teak plantations in the Coimbatore South Forest Division .. 293–294
V. List of herbs, shrubs and trees commonly found in the Coimbatore South Forest Division 295–301
VI. List of grasses commonly found in the Coimbatore South Forest Division 302
VII. Control forms 303–315
VIII. Statement showing the names of District Forest Officers who held charge of Coimbatore South Forest Division 315–316
IX. List of maps appended to the plan 317

PART I.

Summary of facts on which the proposals are based.

CHAPTER I—THE TRACT DEALT WITH

Section 1—Name and situation.

1. This working plan deals with the forests of the Coimbatore South Forest Division as at present. The forests are spread over the Pollachi, Udumalpet and Dharapuram taluks of Coimbatore district and the Kodaikanal taluk of Madurai district constituting in all an area of 94,591·28 hectares or 945.91 square kilometres. In addition to the areas covered by the last working plan, the present plan also includes 43.7 hectares of ex-panchayat forests in the Punachi Range which were taken over under the direct control of the Forest Department in 1961.

2. The tract dealt with lies between 10° 12′ 41″ and 11° 7′ 17″ North Latitude, and 76° 39′ 2″ and 77° 56′ 31″ Longitude, east of Greenwich. To the north are the cultivated plains of Coimbatore District ; the east is bounded by the forests of the Madurai North division, while to the south lie the forest tracts of the Kerala State.

Section 2—Configuration of the ground.

3. The area dealt with can be classified under two categories : (i) The Anamalais, and (ii) The plains forests—each of which may be described separately.

(i) *The Anamalais.*—More than 95 per cent of the forests of the division occur on the Anamalais or Elephant Hills which are a continuation of the Western Ghats situated immediately south of the Palghat Gap. The northern slopes of the Anamalais descend precipitously to the cultivated plains of Coimbatore district. The range is separated from the Bolampatti hills by a break in the Western Ghats known as the Palghat Gap which is about 50 kilometres wide. The main range of the Anamalai hills has a general direction of north-west to south-east, with elevations ranging from about 900 to 2,500 metres. On the south-west of the central spur the gradient is more gentle, the country is an undulating plateau of small rounded hills with an elevation of 900 to 1,500 metres now almost entirely taken up for the cultivation of plantation produce such as coffee, tea, cardamom and cinchona. The north-western portion draining westwards consists of low undulating hills much broken up by streams. Mount Stuart, Ulandi and Palakadavu blocks, rich in teak and other hardwoods, lie in this portion of the tract.

The eastern portion of the tract is drained by the Amaravathi river which has its origin in Travancore. It flows east through the Udumalpet, Dharapuram and Karur taluks until it joins the Cauvery. The Amaravathi is an important source of irrigation. Since the writing of the past working plan, the Amaravathi has been dammed near Manthorai for irrigating an area of about 6,000 hectares of land in the Udumalpet and Dharapuram taluks.

The western range of the Anamalais is drained by a number of streams and rivers, *viz.*, the Thorakadavu, the Aliyar, the Sholayar, the Kallar, the Italiar and a host of smaller streams. Chief of these is the Thorakadavu which has its origin in Travancore, but flows through the Anamalais to join the Aliyar. The combined river known as the Aliyar descends down the hills through a narrow gorge near Navamulai and thence turns westwards towards Malabar to join the Bharathapuzha. Enroute it is joined by a number of small rivers like the Uppar and the Palar which drain the leeward slopes of the Anamalais. The Sholayar, Kallar and Italiar are also important streams traversing the evergreen forests of Punachi Range. All these three rivers flow westwards into Kerala although they take origin in this State. Arising in the western-most portion of the division, namely the Tunacadavu

Range, are a number of small rivers, viz., the Tunacadavu ar, the Periyar and the Sinnar which flow into Kerala State and join the Parambikulam and Chalakudi rivers that drain into the Arabian sea. The Parambikulam-Aliyar multi-purpose project contemplates the construction of as many as five dams across these rivers in the Madras State alone for diversion of the west bound waters to irrigate the parched plains of Coimbatore district as also for the generation of hydro-electric power. The damming of these rivers will result in vast areas of reserved forests within the division being divested of their existing growth almost permanently. The creation of a number of lakes will also considerably change the hydrology of the tract.

(ii) *The plains forests.*—These include small isolated hillocks such as the Periamanimalai and the Attamalai reserves and more or less level tracts such as the Uthiyur and Dalavoipatnam reserves in the Dharapuram taluk.

SECTION 3—GEOLOGY, ROCK AND SOIL.

4. *Rock.*--The division was not geologically surveyed until recently. An officer of the Geological Survey of India has just completed a survey of Pollachi taluk. The Udumalpet Range including the Dharapuram forests and the Kukkal, Kudrayar and Manjampatti blocks are yet to be surveyed.

5. The rock formations of the area consist of the metamorphic and igneous suite of rocks. The major rock types are: (i) Charnockite, (ii) granitic gneiss, (iii) leptynite, (iv) granites and (v) Calc. granulites. These are intruded by later quartz, pegmatite and aplitaplite veins. Such intrusions, however are of far less consequence in the formation of soils.

6. The primary minerals constituting the charnockites are quartz, orthoclase and plagioclase felspars, pyroxenes (hypersthene, diopside and enstatite), and biotite. The alterations are pyroxenes into amphiboles (hornblende) and later into biotite and magnetite. The granitic gneisses consist of quartz, orthoclase and plagioclase felspars and brown biotite. The composition of orthoclase is in general far in excess of plagioclase. The primary minerals constituting leptynites are quartz, orthoclase felspar, pyroxene (hypersthene, augite), and plagioclase felspar. Here again orthoclase is in excess of plagioclase. The alterations are pyroxenes into amphiboles. The granites are either rich in orthoclase felspars and orthoclase-perthite-felspars or rich in microcline and microcline perthite-felspars. The primary minerals are quartz, felspars, a little plagioclase and brown biotite. The minor minerals are magnetite, apatite and zircon. The calc-granulites consist of pyroxene (diopside). scapolite, garnet, magnetite with minor felspars.

7. Whereas the granites and the granitic gneisses occur almost everywhere on the hills, the charnockites occur in characteristic bands only here and there. Wherever they occur, the charnockites have a profound influence on the composition of the soil on account of the greater proportion of ferrugineous minerals. The leptynites occur in the plains and foothills of the Anamalais. The calc-granulites occur extensively in the Udumalpet Range often yielding secondary calcareous beds (Kankar).

8. Whereas in the hills, there are no mineral deposits, a few such deposits are seen to occur in the forests of Dharapuram taluk. In the Attamalai Reserve Forest for instance there appears to be some evidence of the existence of iron deposits (probably haematite), but the percentage of iron in the deposits and its suitability for economic extraction needs further investigation. Some calcite and beryl are also noticed in the Uthiyur Reserve Forest. The latter occurs in the adjoining *patta* lands also and is said to have been extracted in some quantity for sale as semi-precious stone during the panchayat regime.

9. There are no adverse sliding or structural defects in the formation of the area. The angle of din varies from 32° to 46° with an average of 40° which ensures a safe repose of inclination to the soil beds.

10. The scarp hills such as Kolambumalai, Thermalai, Perumkundru, Olakaisathimalai, Chinnathalanarmalai, Mulaimadakku, Varaiyattuthittu, Varasattimalai, Pambumalai, etc., represent scarp faces formed along vertical joint planes.

11. *Soil.*—Of the major rock types of the area, the charnockites are the richest in ferrugineous minerals. The granitic gneisses which occupy extensive areas are richer in quartz and felspar yielding sandy soil. Thus the charnockites yield a thick, heavy, dark, reddish, ferrugineous, loamy soil. The other types of rocks yield gritty, pinkish, sandy soil with the clay content depending upon the richness of felspar in each. The Mount Stuart Block which is mainly composed of granitic gneisses except for a few bands of charnockite has in general a gritty soil with a low percentage of ferrugineous elements. The Ulandi and Palakadavu Blocks, the Manamboli valley and the whole of the Punachi plateau are comparatively richer in ferrugineous elements due to the several intrusions of charnockite. These areas are subjected to a high degree of rainfall which in places is even more than 500 centimetres and so when stripped of their vegetation, secondarily leads to a lateritic formation due to the leaching of calcium and potash into the lower layers of the soil. Yet such a feature is not on a vast scale, but some typical areas can be seen around the Kallar, Italiar and Manamboli valleys. In general, areas blessed with a rainfall of 100 centimetres and above have an acidic soil, the pH value being inversely proportional to the quantity of precipitation received.

12. In the Udumalpet Range and the eastern half of Pollachi Range where the leptynites, granitic gneisses and calc-granulites are the chief formations, the soil is gritty and sandy with a high percentage of quartz pebbles, undisintegrated granite and kankar. The soil here is essentially alkaline tending to favour the growth of *Acacia* species.

13. The formation of secondary calcareous material known as kankar is nil to absent in the Tunacadavu and Punachi Ranges, and the western half of Pollachi range, but such a formation is considerable in areas east of Aliyar and in the Dharapuram forests.

SECTION 4—CLIMATE AND RAINFALL.

14. Wide variations of annual rainfall, elevation and aspect have resulted in a highly variable climate. The south-western slopes, viz., the plantation areas around Valparai with an annual rainfall of 375 centimetres to even over 500 centimetres have a moist tropical climate passing into a sub-tropical one at higher elevations. The north-western corner facing the Palghat gap has a rainfall of about 125 centimetres and has a tropical monsoon climate, while the north-east slopes of the Anamalais and the plains of Dharapuram taluk are dry, the rainfall being about 50 centimetres.

15. *Temperature.*—The shade temperature during the day varies from 23° C to 40°C at the foot of the hills. The night temperatures vary between 18° C to 30° C. At higher elevations, the temperature is naturally lower often dropping below the freezing point in the Grass Hills during winter. December and January are the coolest months of the year and the climate on the hills is often marred by dense chilly mists. Towards the end of February, the climate becomes sultry on the plains, March to May being the hottest period when the days are very oppressive. The few thunder showers that are usually received during April and May have little effect in mitigating the oppressiveness of the weather, but are useful in reducing fire-risks and promoting artificial regeneration of teak by the stump method. Towards the end of May, the south-west monsoon bring welcome relief and the climate continues to be pleasant and cool until August when the monsoon abates. September again is sultry, but October and November experience an equable climate when the north-east monsoon is in operation.

16. *Rainfall.*—Of all the forest divisions in the Madras State, the Coimbatore South Forest Division perhaps exhibits the widest variation in annual rainfall among its different parts. The annual precipitation is as low as 50 centimetres in the plains of Dharapuram taluk and the north-eastern portions of Udumalpet taluk, while over 500 centimetres fall on the hills of Punachi Range.

17. In the Anamalais, both the south-west and the north-east monsoons are received. The former is active from late May to early September and the latter from October to December. The rainfall is controlled by the topography, as the high hills lying across

the path of the south-west monsoon help to precipitate their moisture on the windward side, whereas the areas on the leeward side receive comparatively little rain from the south-west monsoon, the bulk of the precipitation being from the north-east monsoon.

18. The ex-panchayat forests of Dharapuram taluk which are far away from the hills receive rain entirely from the north-east monsoon, precipitation from the south-west monsoon being practically nil.

19. A tabular statement showing the average annual and monthly rainfall in centimetres at the various recording stations within the region during the past ten years is appended.

20. There are 5 rain guage stations in the division maintained by the department, but regular recordings have not been made for some years. Whatever figures that are available are quoted here.

STATEMENT SHOWING THE AVERAGE MONTHLY AND ANNUAL RAINFALL IN CENTIMETRES FOR THE PERIOD FROM 1953 TO 1962.

Name of station. (1)	*January.* (2)	*February.* (3)	*March.* (4)	*April.* (5)	*May.* (6)	*June.* (7)	*July.* (8)	*August.* (9)	*September.* (10)	*October.* (11)	*November.* (12)	*December.* (13)	*Annual.* (14)	*Remarks.* (15)
1. Waterfall Estate ..	2·9	2·0	1·9	14·7	23·6	57·5	91·1	37·6	22·9	24·4	18·5	9·8	306·9	
2. Paralai Estate ..	0·9	2·3	3·3	13·3	27·0	59·7	84·2	50·6	27·7	29·3	12·3	2.8	313·4	
3. Karumalai Estate.	1·5	2·1	4·3	12·9	28·0	66·9	96·4	53·4	32·7	29.8	12·3	3·3	343·6	
4. Old Valparai Estate.	0·7	1.9	3·5	14·1	26·6	53·3	77·2	42·1	24·4	26·6	9·8	1·6	281·8	
5. Cinchona 1st Division.	2·1	3·2	5·4	19·5	32·2	19·7	120·6	76·7	44·4	35·0	13·6	3·1	375·5	
6. Kadamparai (Cinchona VIIIth division).	0·9	1·6	1·5	16·4	26·5	71·0	103·0	58·4	31·4	27·8	17·6	4·7	360·8	
7. Velonie Estate ..	0·5	3·9	2·6	11·9	24·0	57·0	89·5	44·0	27·1	29·0	14·5	4·4	308·4	
8. Mount Stuart Estate	3·4	1·6	2·2	110·4	23·2	66·3	95·4	58·2	39·7	31·3	17·9	57·5	507·1	
9. Manamboli Estate	0·5	2·1	6·4	14·9	24·5	53·8	61·7	38·3	27·0	26·8	12·2	1·7	269·7	
10. Akkamalai Estate.	1·9	2·6	3·5	11·3	30·7	78·6	110·4	70·2	40·0	31·8	13·0	5·0	399·0	
11. Dharapuram ..	0·9	1·5	1·4	6·7	6·9	1·6	1·7	2·0	4·5	12·1	10·8	3·3	53·4	
12. Amaravathi Nagar.	2·5	0·9	0·8	6·1	7·2	3·8	2·5	1·8	2·8	18·1	18·6	6·7	71·8	Available from 1955 to 1962 only.
13. Esalmaathorai ..	0·3	1·1	1·1	2·8	8·7	0·4	7·7	0·7	2·3	14·8	13·8	1·8	55·5	Available from 1957 to 1962 only.
14. Udamalpet ..	1·7	1·1	0·8	6·9	9·8	3·1	4·4	1·1	1·5	2·9	5·9	3·4	41·7	Available from 1953 to 1962 only.
15. Topslip*	2·3	0·5	1·6	8·6	15·3	26·5	41·6	18·6	11·6	17·5	15·1	4·2	163·4	Available from 1953 to 1962 only.
16. Varagaliar* ..	0·6	3·6	2·6	13·1	19·1	16·5	70·3	30·3	10·0	17·9	13·7	0·9	198·6	Available from 1957 to 1962 only.
17. Sethumadai* ..	0·8	..	1·5	3·5	7·3	8·6	19·1	6·6	3·2	14·3	11·4	2·8	79·1	Available from 1955 to 1962 only.
18. Pollachi	0·6	0·9	1·5	6·4	12·4	11·0	19·7	8·7	4·7	14·5	14·9	3·8	99·1	Available from 1953 to 1962 only.

NOTE.—* Represents forest rain gauges. Regular recordings have not been made from the forest rain gauges at Waterfalls and Grass Hills. Hence, they are omitted from the above statement.

21. *Winds.*—Southerly winds set early in April and the tract is then subjected to strong gales. Thunder storms are fairly common during this period with occasional bursts of rain. Towards the end of the month, the southerly winds become more frequent. In May, the direction of the winds becomes more westerly. The south-west monsoon sets in late May or early June and brings plenty of rain right on the hills as also a milder drizzle on to the leeward slopes of the Anamalais which becomes progressively weaker as one travels eastwards. In the far flung forests of Dharapuram taluk, there is little or no rain, but heavy dust storms are caused by the violent action of the south-west winds. The cool south-west winds rush with great violence through the Palghat Gap, its impact being felt over the entire division. The south-west monsoon continues until September when the winds begin to swerve back to the south and later on to the south-east. By October, the north-east monsoon sets in and continues until December. The north-east winds are normally much milder and bring more rains to the plains and the outer slopes of the Anamalais.

22. *Health.*—Malaria which was once prevalent on the hills in a virulent form is now a thing of the past. Thanks to the efforts taken under the National Malaria Eradication Programme with assistance from the World Health Organisation, along with the advent of synthetic insecticides and powerful anti-malarial drugs, the disease has been practically wiped off from the division. Prophylactic measures such as annual spraying of synthetic insecticides in dwelling places and stagnant pools, clearing of marginal vegetation around habitation, examination of blood smears for malarial parasite in all cases of fever suspected to be malarial and such other anti-malarial operations are still being done under the National Malaria Eradication Programme, with the co-operation of the Forest Department. A forest dispensary with a Medical Officer and necessary complimentary staff has been functioning at Topslip since 8th December, 1950. The dispensary which was originally opened mainly with the aim of combating the malarial menace still helps to treat suspected cases of malaria if any, apart from dealing with other types of sickness.

23. Small-pox occurs periodically in waves among the hill tribes sometimes taking a good toll of life. In the past, several flourishing Pulaya settlements in the Udamalpet Range are said to have been abandoned on account of small-pox, the few survivors left by the disease having fled to adjacent settlements. Even during the course of compiling this working plan, several deaths have occurred on account of small-pox among the Pulaya settlements, and in one settlement alone, namely Kanuvoipatti, as many as 17 people had died in one week just a few days prior to the writer's camp on the Mavadup plateau and 10 others were found seriously ill with the disease. The spread of epidemics is largely favoured by poor sanitary conditions around their dwelling huts and surroundings, close proximity of pens with their resultant dung and stink, and an age-old apathy for vaccination which appears to have arisen due to fear rather than tradition. Sporadic outbreaks of small-pox also occur in the villages adjoining the forests sometimes resulting in a few deaths. These are however quickly brought under control on account of their easy accessibility to the health authorities. Periodic vaccination (both primary and secondary) has been taken up under the Small-pox Eradication Programme and it is hoped that the incidence of small-pox both on the plains as well as on the hills will be reduced to negligible proportions in the not too distant future. Other prophylactic measures to prevent the disease are mentioned in Part II.

24. Apart from small-pox, other forms of sickness arising in the region are generally seasonal. Diseases of the respiratory tract such as colds, coughs and bronchitis are common in the hills during the winter and in the rainy season due largely to climatic conditions. Similarly during hot weather, intestinal diseases such as diarrohoea and dysentry (both amoebic and bacillary) make their appearance due to scarcity of water and consequently greater pollution of the limited supplies of water. Amoebic dysentry in particular is said to be endemic at Topslip as the water supply from the Karianshola reservoir is not well protected.

Section 5—WATER SUPPLY.

25. The Ulandipallam, the Sinnar, the Periyar, the Aliyar, the Thorakadavu ar, the Kallar, the Italiar, the Sholayar, the Amaravathi and its tributaries (Tenar, Chinnar and Pambar) are all perennial rivers, in whose vicinity, water supply is good and ample. The forest colonies at Anaigundi, Anamalai and Sethumadai, and the Pollachi Timber Depot are all provided with wells.

26. In the plains and foot-hills of Udamalpet Range, a general scarcity of water is felt all over during most part of the year. The subordinate lines at Manupatti and Easalmanthorai, and the Range Office at Udamalpet are however provided with wells which do not go dry during summer and therefore no difficulty is experienced. There are many perennial springs and streams in the Pundi-Mavadup plateau which provide water to grazing cattle penned in the area.

27. For the residents at Topslip, the water supply is generally from the Karianshola reservoir which was built in 1927. The supply from this reservoir is generally erratic and inadequate during summer and as an alternative source there are two wells near Topslip, just below the Sungam Ghat road. In order to augment the supply, the Divisional Engineer (Public Health) suggested in 1950, the construction of another small reservoir just above the present one, in order to store a large supply of water. Although necessary sanction for this was obtained from the Government, the work could not be carried out, as the reservoir and headworks became part of the new Kerala State following 'States reorganisation'. Apart from the water-supply being inadequate during summer, it is not well protected. Repeated analysis of the water by the Public Health authorities has revealed that it is unfit for human consumption due to the presence of a high percentage of bacteria and harmful organic content. It is also believed that the unprotected water-supply from the Karianshola reservoir is contributory to the endemic nature of dysentry in the region. Suggestions to protect the water-supply and make it more stable are made in Part II.

28. With the advent of the Parambikulam-Aliyar Project, one of the wells at Topslip was handed over temporarily to the Public Works Department for providing water-supply to the Parambikulam-Aliyar Project colony. The Public Works Department have fitted an electric motor to this well which pumps water to a storage tank constructed near the Topslip Forest Rest House from where water is supplied to the rest house as also the Parambikulam-Aliyar Project colony. The water-supply is however inadequate during summer and water has to be often transported by water lorries from Tunacadavu in Kerala State.

Section 6—DISTRIBUTION AND AREA.

29. The Coimbatore South Forest Division is divided into four territorial ranges, viz. (1) Pollachi, (2) Tunacadavu, (3) Punachi and (4) Udamalpet. The distribution of forests in each range is as follows :—

Name of the range.	*Area in Hectares.*
(1) Pollachi	12,343.52
(2) Tunacadavu	14,441.71
(3) Punachi	21,601.79
(4) Udamalpet	46,204.26

30. The area noted against Punachi Range includes an area of 3,823.51 hectares handed over to the Cinchona Department [since the area has not yet been disreserved], as also a block of 43.70 hectares of ex-panchayat forest in Sirukundra which was taken over in 1961, and remain to be notified

31. A complete list of all the forests in the division, their extent and legal position is given in Appendix II. Discrepancies are noticed in the areas of each reserved forest as furnished in the Reserve Book from the figures arrived at by actual computation during the preparation of this plan. These differences are considerable for the Anamalai and Amaravathi Reserves which are contiguous and appear to have arisen on account of the dividing line between these two reserves being not clear on the maps or in the field.

32. The total area of each range shown in the statement under paragraph 29 or that of each reserve shown under Appendix II is to a certain extent deceptive, as considerable areas have been and several more will be soon divested of their tree growth, consequent to the activities of the Parambikulam-Aliyar Project and the construction of a series of dams within the region. The areas thus divested of their tree growth will continue to remain as reserved forest legally, although they will be lost to forestry as such. The actual area thus lost will be known only after the Parambikulam-Aliyar Project is completed.

33. There is a proposal to take over 1,116.81 hectares of unassessed waste land in survey field Nos. 648 to 651 of Andigoundanur village of Udamalpet taluk. This area is locally referred to as Jambukal. The Andigoundanur Panchayat has consented to hand over the areas to the Forest Department. The question of taking over this land is now under correspondence with the Revenue Department.

Section 7—STATE OF BOUNDARIES.

34. *External boundaries.*—The Pambar, the Chinnar, the Italiar and the Sholayar for a good distance form the southern boundary of the division. Similarly in the east, the Navalodai stream forms the eastern boundary of the division to a certain distance. Where natural boundaries do not exist, the outer boundaries of the reserves are defined by cleared boundary lines 3.60 to 5.49 metres wide with cairns and numbered stone pillars. Small stones have been kept in lines between the cairns in many of the reserves.

35. Owing to the great length of boundary lines and the inadequacy of staff, the boundaries are not regularly and properly cleared. The stone pillars have been knocked down by elephants in many places, while the numbers on several others have been obliterated due to efflux of time. A few discrepancies have also been noticed by the writer between the boundaries of the reserves as they exist on the ground and as represented on the Survey of India maps. Prescriptions to rectify these discrepancies are made in Part II.

36. The outer boundaries of the ex-panchayat forests in the Dharapuram taluk have not been maintained satisfactorily during Panchayat management. In most cases the cairns are missing; even where they are present, the numbering on most of them does not tally with the numbers given on the reserve map. Since these forests adjoin cultivation on all sides, it is quite likely that there may be some encroachments which can be detected only when a thorough verification of the boundaries is undertaken. Suggestions to this effect are made in Part II.

37. *Inter-state boundaries.*—Prior to ' States reorganisation ', the inter-state boundary between Madras and the erstwhile Travancore-Cochin state consisted of cleared lines 5.49 metres wide where natural boundaries did not exist. Those lines used to be cleared by the Madras Forest Department once in three years, the cost being shared both by Madras and the erstwhile Travancore-Cochin State. These boundaries have not been cleared since ' States reorganisation ' and have now overgrown. With the transfer of Thekkadi leased forests to the Kerala State following ' States Reorganisation ' in 1956, the necessity to demarcate on the field the boundary between Tunacadavu R.F. and the Thekkadi leased forests also has arisen. This boundary which was perhaps uncleared for over a century (ever since these forests were taken on lease by the British) is now completely overgrown. The question of clearing this boundary as also all the other boundaries between Madras and the new Kerala State is now pending with the Kerala Board of Revenue.

38. *Internal Boundaries.*—The internal boundaries between the reserved forests and the enclosures (including the areas disreserved for the Anamalai estates) have survey stones planted along them. Not all of them are kept permanently cleared. It seems desirable that they should be permanently demarcated with white-washed cairns to avoid encroachments. Verification of the boundaries of the Anamalai Estates was taken in 1961-62 by a Special Deputy Surveyor sanctioned by the Government. Verification of about 33.64 kilometres has been completed by him so far and construction of cairns in the verified portion is presently being done. Encroachments noted are also being dealt with. The remaining length of 88.51 kilometres is yet to be verified and cairns constructed. The work has again been resumed during 1963–64.

39. Survey and demarcation of the area leased out to the Cinchona Department in the Kadamparai Valley is necessary and will be therefore prescribed in Part II.

SECTION 8.—LEGAL POSITION.

40. Excepting a small bit of 43.7 hectares of ex-panchayat forests in Sirukundra which was taken over by the department during 1961, all the other forests comprising of this division have been notified as reserved forests under Section 16 of the Madras Forest Act of 1885 and form the absolute property of the State subject to certain rights and concessions. The details of notification are given in Appendix II.

SECTION 9.—RIGHTS AND CONCESSIONS.

41. *Rights.*—All the reserved forests are the property of the Government and none is encumbered with any rights of importance. The rights admitted at settlement are mainly rights of way, rights to cut channels and divert water from streams, and right to access to temples. A list of admitted rights are given in Appendix III.

42. *Licences.*—The entire division is closed to shooting since 1963. The question of issuing licences for shooting game therefore does not arise. The right of fishing in the Konalar and Chinna Konalar rivers in the Punachi Range was leased out to the Konalar Fishing Association for a period of ten years from 15th January, 1949. The lease has been extended to a further period of 5 years from 31st January, 1959. A lease amount of Rupees 50 per annum is collected from the Konalar Fishing Association and the revenue is credited to the Fisheries Department.

43. The District Forest Officer also issues annual permits for the right to run tea shops or provision stores in specified localities within the reserved forests, the right being sold in auction annually. Apart from lease of forest lands for commercial enterprises as this, extensive areas have been given on lease to the Public Works Department and the State Electricity Board for the execution of the Parambikulam-Aliyar Project and the Parambikulam-Aliyar Hydel scheme.

CHAPTER II—THE FORESTS.

SECTION 1.—COMPOSITION AND CONDITION OF THE CROP.

44. The tract dealt with stretches over a territory with a great diversity in its topography, climate and rainfall, that it bears a vegetation of wide and striking variation. The elevation varies from 350 metres in the plains and foot hills of the Anamalais to over 2,400 metres in the Grass Hills of Punachi Range with a corresponding variation in rainfall from just about 50 centimetres to nearly 750 centimetres. At the foot of the hills the day temperature ranges between 23° C to 40° C and the night temperature from 18° C to 29° C. At higher elevations the temperature is naturally lower, often dropping below the freezing point in the Grass Hills during winter. The mean annual humidity in the pains is 51 per cent while at higher altitudes where there is greater rainfall, the relative humidity is as high as 70 per cent. These variations combined with dfferences of soil and aspect have resulted in a considerable variety of vegetational types, not to

mention of plantations created by human agency. Fires, over-grazing, shifting cultivation and excessive fellings in the past are also other biotic factors which have helped to cause variation in vegetation

45. The forests of Coimbatore South division may be broadly classified under the following forest types according to Champion's classification :—

(i) 5aC1—Southern Cutch thorn forests.

(ii) 5aC2—Carnatic umbrella thorn forests.

(iii) 4aC1—Southern tropical dry deciduous forests—Dry teak forests.

(iv) 2S/3—Dry Savannah forests.

(v) 3aC1—Southern tropical moist deciduous forests—South Indian moist deciduous forests.

(vi) 2s/6(a) Southern tropical secondary moist deciduous forests.

(vii) E1O(a)—Southern moist bamboo brakes.

(viii) 1aC3—Southern tropical wet evergreen forests-Western tropical evergreen forests.

(ix) E9—Southern wet bamboo brakes.

(x) 7aC1—Nilgiri Sub-tropical evergreen forests.

(xi) 10aC1—Southern wet temperate forests.

46. (i) *Southern Cutch thorn forests.*—This type of forest is confined to the eastern half of the Pollachi Range and over a major portion of the Udumalpet Range where the annual rainfall varies from 50 to 75 centimetres received largely from the north-east monsoon. The climate is hot and dry with the shade temperature rising up to C during summer. The forest here is either on plain or gently undulating country and extends up to an elevation of 600 metres along the outer slopes of the Anamalais. The soil is almost always shallow and dry with bouldery outcrops of granite as in the hill slopes, or gravelly with quartz pebbles as in the plains and foot-hills. The soil is generally alkaline and not infrequently kankar granules are met with.

47. The forest is generally poorly stocked with trees of small height and "low branching crowns which rarely meet". The maximum height attained is 6 to 9 metres. As a rule, species of *Acacia* predominate with a "mixture of other species (though relatively few in number)" but not even of fuel value. The understorey is ill-defined with smaller trees and large shrubs, mostly spiny or with other xerophytic characteristics. Fleshy Euphorbias are common. Herbaceous growth or grasses appear during the short monsoon period to dry or disappear soon leaving the forest floor bare once again. Climbers are few but when present are frequently with xerophytic adaptations.

This type of forest being close to the country-side is subjected to heavy grazing and trampling, illicit fellings, and not infrequently forest fires. Areas subjected to heavy abuse in the past are virtually treeless with *Euphorbia* and scrub.

FLORISTICS.

I. *Acacia, leucophloea, Acacia ferruginea, Acacia planifrons, Albizzia Gyrocarpus jacquinii, Protium caudatum, Commiphora berryi, Crataeva religiosa, Atlantia monophylla.*

II. *Acacia latronum, Euphorbia antiquorum, Capparis zeylanica, Cassia auriculmata, Randia dumetorum, Acalypha fruticosa, Calotrophis gigantea, Cerissa carandas Dodonea viscosa, and Guazuma tomentosa.*

III. Undergrowth is sparse. Usually consists of few grasses.

IV.—*Climbers.—Cissus quadrangularis, Cardiospermum species, etc.*

48. *Natural regeneration.*—Coppice regeneration is fair, but natural regeneration of useful species is scarce.

49. *Artificial regeneration.*—Sporadic efforts were made to artificially regenerate this type of forest in areas endowed with a fair amount of soil. Small areas in the Pollachi Range have been regenerated successfully with Neem, *Acacia arabica* and other fuel species under the name of ' Soil Conservation plots '. Since 1957, attempts were also made to regenerate felled fuel areas in th Udumalpet Range with softwoods and miscellaneous fuel species with varying success. The details of planting are analysed in Chapter V.

(ii) *Carnatic umbrella thorn forests.*

50. This type of forest occurs in the Periamanimalai, Attamalai and Thalavoipatnam ex-panchayat reserves of Dharapuram taluk. The locality factors in this type of forest are almost the same as in the Cutch thorn forest but the soil is extremely shallow and sterile with frequent outchops of granite. Kankar nodules occur plentifully below the surface.

51. *Acacia planifrons* with its characteristic umbrella shaped crown forms nearly 60 per cent of the crop, often in association with thickets of *Acacia latronum*. Other thorny species may also occasionally occur in mixture. Undergrowth is generally absent, but when present consists of a sparse growth of thorny shrubs.

52. Just like the Cutch thorn forests, these forests too suffer most from biotic influences, as they are situated right in the heart of the plains.

Floristics.—

I. *Acacia planifrons, Acacia latronum, Acacia leucophloea, Albizzia amara.*

II. *Capparis decidua, Randia dumetorum, Dichrostachys cinerea, Zizphus mauratania.*

53. *Natural regeneration.*—Natural regeneration of *Acacia planifrons* and *Acacia latronum* is fair but requires augmentation.

54. *Artificial regeneration.*—Artificial regeneration with softwoods and various fuel species has been tried in the Thalavoipatnam reserve with little success.

(ii) *Southern tropical dry deciduous forests—Dry teak forests.*

55. This type of forest occurs as a climax formation in areas endowed with a rainfall of 100 to 150 centimetres at elevations ranging between 350 metres to 900 metres as may be seen in the Punachi Block and along the foot-hills and lower slopes in the western half of the Pollachi Range. Where the rainfall drops below 100 centimetres, the vegetation changes into a thorn forest.

56. Most of the species occurring in this type are common to the moist deciduous type, but they reach a finer development there, the height of the dry deciduous forest being typically 15 to 22 metres. The total number of species forming the top canopy are few as in the preceding types and occur in intimate mixture, gregariousness being rather uncommon. Practically all the trees are deciduous during the dry season usually for several months, though some for a short period only. The lower canopy is likewise almost deciduous, although evergreens or semi-evergreens are sometimes confined to moister or sheltered spots. There is some admixture of sandal in the Punachi Block and in the Thalinji–Manjampatti valleys, which appears to have spread from dibbling of seeds done in the past but it is of little economic importance as there is very little heartwood formation. Bamboos are often present but are not luxuriant. An undergrowth of shrubs is usually present. The canopy being rather open, there is usually some growth of grass which with repeated burning tends to become heavy resulting in 'savannah or park like forms ' with isolated trees of fire-hardy species as typically seen in the Thorakadavu valley of Punachi Range. The Pundi-Mavadup plateau and the Thalinji-Manjampatti valley, are other instances where similar savannah-like conditions are gradually setting in due to repeated fires and over-grazing.

57. Gregarious flowering of *Dendrocalamus strictus* commenced in the Udumalpet Range in 1953, and practically all the bamboos have died. Flowering in the Pollachi Range commenced in 1956, and here again most of the clumps have died. In the Pundi-Mavadup plateau and the Lower Punachi and Thorakadavu valleys, flowering commenced in 1960. Here too most of the clumps have flowered and died.

Floristics.—

I *Tectona grandis, ptcrocarpus Marsupium, Anogeissus latifolia, Terminalia tomentosa, Terminalia chebula, Lannea grandis, Albizzia odoratissima, Albizia lebbak, Sapindus emarginatus, Bridelea retusa, Dalbergia latifolia,* and occasoinally Salmalia *malabarica.*

II. *Streblus asper, Cariaeva religiosa, Azadirachta indica, Morinda tinctoria, Wrightia tinctoria, Santalum album.*

II (*i*) *Dendrocalamus strictus* and *Bambusa arundinacea* (alnog moist patches).

III. The undergrowth is chiefly of *Lantana camara* or of *Helictores isora* in certain localities. In other areas there is usually heavy grass.

IV. *Climbers: Acacia intsia* and *Pterolobium indicum* often form impenetrable thickets in felled coupes. Other species like *Abru sprecatorius, Dioscroea* species may also occasionally occur.

58. *Natural regeneration.*—Natural regeneration of valuable species is poor in this type of forest as in the moist deciduous type. Natural regeneration of bamboos following gregarious flowering is generally inadequate.

59. *Artificial regeneration.*—Artificial regeneration of several species has been successfully done in this type of forest particularly in the Pollachi Range where this class of forest is generally worked for fuel. The earliest plantations raised were that of mixed fuel species such as *Acacia arabica, Prosopis juliflora,* Neem, Tamarind, etc., but in the suceeding rotation, various other species such as *Ailanthus excelsa, Salmalia malabarica,* Teak, *Dalbergia sissoo Pterocarpus marsupium, Dalbergia latifolia, Terminalia tomentosa* and *Eucalyptus* hyorid have been raised either as pure plantations or in mixture with one another. Almost all the species planted have come up successfully, but *Eucalyptus* hybrid has given the best results of all.

60. In the dry teak forests of Lower Punachi, teak planting was regularly prescribed from 1936 and a series of plantations were raised until 1952, often in mixture with other species like *Pterocarpus marsupium, Dalbergia latifolia* and even sandal. Since most of the plantations raised proved to be much below expectations, further planting was given up. Teak planting at Lower Punachi has again been revived since 1957 and an average area of 20 hectares has been felled annually and planted with teak up till 1963.

(*iv*) *Dry Savannah forest.*

61. This type occurs in the Thorakadavu valley and over extensive areas in the Pundi-Mavadup plateau and Thalinji–Manjampatti valleys. The Nellimedu saragam of Villoni valley is another typical example. Rocky and shallow exposed ridges up to elevations of 1,200 metres along the outer slopes of Pollachi Range are also occupied by this type, but but they are of only limited occurrence.

62. This type is essentially of secondary origin and probably once consisted of a dry deciduous forest which has now assumed a savannah-like form due to repeated fires caused by graziers and minor forest produce collectors. Heavy grazing and trampling are also other contributory causes. In this type the more or less closed formation of the dry deciduous forest is lost and trees occur singly or in small groups standing in more or less heavy grass in which certain fire resistant species persist. The trees have short boles and are usually crooked, unsound and hollow with thick bark and deep fissures. Thorny shrubs are common; *Phoenix* is in particular very characteristic. The fires encourage the growth of heavy grass which in turn predispose the fire thereby resulting in a vicious cycle from which there is little escape. With adequate fire protection this class of forest would probably revert to the dry deciduous type in course of time, but this appears most

unlikely as long as present methods of grazing, penning and minor forest produce collection continue to be in vogue. 'As the conditions which lead to the development of savannah forest render it more xerophytic than corresponds to the climate, the savannah types of the moist tropical approximate considerably to those of the dry tropical areas' (Champion, 1936).

Floristics :

I. *Terminalia chebula, Pterocarpus marsupium, Shorea talura, Anogeissus latifolia, Buchanania lanzan, Givottia rottleriformis, Diospyros melanoxylon, Cochlospermum religiosum, Emblica officinalis, Cassia fistula.*

II. *Phoenix acaulis, Randia dumetorum. Algyreia cuneata* is common on the Pundi-Mavadup plateau.

III. The undergrowth is of dense grasses, chiefly *Cymbopogon flexuosus.*

63. *Natural regeneration.* The fire resistent species regenerate fairly but are burnt back annually.

(v) *Southern tropical moist deciduous forests.*

64. Economically speaking, this is the most important type of forest in the division and is largery confined to the Tunacadavu Range Outside the Tunacadavu Range, it occurs in restricted localities in the Villoni, Pachathanni and Ayerangal valleys of Pollachi Range. This type occurs in regions with elevations ranging from about 450 metres to 950 metres and rainfall from 150 centimetres to 300 centimetres received from both the monsoons. Teak is the most important species of this type, but forms only 10 to 15 per cent of the stocking.

65. Champion describes this type as 'a closed high forest, commonly of good height 100–120 feet or more, the dominant species being mostly deciduous. Although intimate mixture of species is the rule, a relatively small number of species together form greater part of the canopy and relatively pure associations are fairly frequently met with'. Under favourable conditions the trees mostly have a rounded crown with tall cylindrical boles. Fluting of the stems is often a common feature; particularly teak and *Schleichera oleosa.* A characteristic feature is the thick bark, mostly fibrous and fissured in all shapes. A bamboo undergrowth is characteristic though locally absent. Climbers are abundant and large.

66. The moist deciduous type occurs at its best in areas of well drained fertile soil. In shallow bouldery areas the quality falls off and gregarious patches of stunted trees of *Terminalia tomentosa, Pterocarpus marsupium, Anogeissus latifolia, Sterculia villosa* and *Emblica officinalis* can be met with an undergrowth of *Cycads* and dense *Lantana.* A third sub-type infesting swamps with *Imperata cylindrica* and a sparse crop of trees like *Terminalia tomentosa, Cinnamomum zeylanicum, Randia uliginosa* and *Zizyphus xylopyrus* is also seen.

67. The chief features of the moist deciduous type 'is the leafless period during the dry season which may or may not begin with the cold weather but is typically more general in March-April when the upper canopy is entirely leafless though there is often a sprinkling of evergreens in the underwood and shrub cover. An appreciable number of the deciduous trees, however, come into new leaf (and often flower) long before the monsoon and unexpectedly spread their foliage at a time when one would expect them to experience great difficulty in obtaining enough moisture for the intense transpiration which must take place. Teak drops its leaves early in the cold weather in localities which are relatively dry or cold but is almost evergreen in the moistest parts of its distribution .... *Terminalia tomentosa. Adina, Lannea* and many others gradually drop their foliage during the cold weather and do not leaf again till rain falls .... Quite a number of species flower more or less leafless .... *Salmalia, Cassia fistula, Sterculia* sp. *Erythrina, Lannea* .... (Champion, 1936).

68. It can be said that the moist deciduous type occurs as a climax formation in areas endowed with a rainfall of 150 centimetres to 200 centimetres as may be seen in the Mount Stuart Block, but a similar formation can be seen even in regions receiving a rainfall up to 300 centimetres due to continuous biotic influence, chiefly fire. The deciduous forests of the Ulandi and Palakadavu Blocks are typical examples. These forests can be called a secondary moist deciduous forest. Champion himself has distinguished a secondary type of deciduous forest—2 S/6 (a) ' Southern tropical secondary moist deciduus forest '. In his description of this type, he admits that " moist deciduous forest is found over considerable areas which experience the climate appropriate to tropical evergreen or at least semi-evergreen forest......... This is conspicuous along the whole length of the Western Ghats. There can be little doubt that these forests are of secondary origin the climatic climax having been displaced by human action .... ". This type is also characteristic in that the undergrowth is frequently evergreen giving the forest as a whole a more or less evergreen appearance most of the year. If left to itself the moist deciduous (secondary) forest tends to progress towards an evergreen climax; such a tendency is not noticeable in the climax deciduous type as the climate in which it thrives cannot support an evergreen forest.

Floristics :

I. The most characteristic species is *Terminalia paniculata* associated with *Terminialia tomentosa, Lagerstroemia lanceolata, Grewia tiliaefolia, Tectona grandis, Cordia dichotoma, Radermachera xylocarpa, Stereospermum personatum, Vitex altissima, Dalbergia latifolia. Pterocarpus marsupium, Dillenia pentagyna, Salmalia malabarica, Adina cordifolia, Schleichera oleosa, Anogeissus latifolia.*

II. *Streblus asper, Olea dioica, Sterculia villosa, Bauhinia malabarica, Zizyphus oenoplia, Zizyphus xylopyrus, Sterculia villosa, Mallotus phillippinensis, Cascaria tomentosa.*

II (a). *Bambusa arundinacea* is abundant.

III. *Lantana* camara is abundant in teak plantations. *Imperata cylindrica* is another scourge particularly along swamps. Other common weeds are *Helcteres isora Desmodium pulchellum and Glycosmis pentaphylla.*

IV. *Climbers :—Marsdenia volubilis, Entada phaseoloides, Butea superba.*

69. *Natural regeneration.*—Natural regeneration of valuable species like teak and *Dalbergia latifolia* is generally inadequate thereby making artificial regeneration imperative.

70. *Artificial regeneration.*—Efforts have been made from very early times to convert suitable areas in the moist deciduous forests into pure plantations of teak. Large areas in the Tunacadavu Range have been thus converted into teak plantations.

(vi) *Southern moist bamboo brakes.*

71. This type is a subsidiary edaphic formation of the moist deciduous forest and occurs locally in the Tunacadavu Range with a more or less continuous forest of tall clumps of *Bambusa arundinacea* with occasional standards of Terminalias and others. The natural occurrtnce of bamboo brakes is along stream banks and shady slopes thereby suggesting their dependance on soil conditions; but they seem to have extended their territory greatly as secondary associations. Such gregarious patches of bamboo are common in the Tunacadavu Range at elevations between 450 metres to 900 metres. Clearfelling followed by artificial regeneration of teak is clearly inadvisable in this type of forest as the bamboos regrow and are difficult to eradicate.

Floristics :—

I. *Terminala tometosa, Lagerstroemia lanceolata, Albizzia, Termlalia paniculata, Terminalia belerica.*

II. *Bambusa arundinacea.*

III. *Clerodendron viscosum.*

(viii) *Southern tropical wet evergreen forests—Western tropical evergreen forests.*

72. The tropical evergreen forests are confined mainly to the Punachi Range but they are seen to project eastwards into the Udumalpet Range at higher elevations. In the Tunacadavu Range they occur in a few compact blocks in the Mount Stuart, Ulandi and Palacadavu blocks in hollows or moist depressions or along the river valleys to a certain width. The sholas once occupied an area of about 400 sq. kilometres in the Punachi Range in a continuous stretch between 900 metres and 1,350 metres but about half of this has been disafforested for the planting of coffee, tea, cardamom and cinchona.

73. The tropical evergreen forests usually occur as a climax formation in regions with elevations from 450 metres to 1,050 metres and where the annual rainfall is over 200 centimetres. In exceptional cases, the evergreen forest may exist even in localities of lesser rainfall than this, like for instance the Karianshola forest near Topslip which has an average rainfall of only 170 centimetres. An evergreen forest cannot be therefore determined by local precipitation alone. Due to more favourable moisture conditions in the soil or due to a sheltered situation, a more advanced stage beyond the normal climax can be attained. Thus an evergreen forest can be encountered within a climate, where the normal climax is deciduous. ' The term post-climax is often applied to this, just as a pre-climax is used for a premature stabilisation due to some non-climatic factor ' (F.E. Clements, 1916).

74. Wherever it occurs, the tropical evergreen forest exhibits a bewildering multiplicity of vegetation. These forests present a spectacle of awe and confusion and appear as a chaotic mass of vegetation with leaves and stems packed in every inch of space. Champion describes the tropical evergreen forests as 'lofty, dense, evergreen forests, 150 feet or more high, characterised by the large number of species of trees which occur together............Some species of the top storey are trees with clear boles 100 feet long and 15 feet or more in girth and may be decidnous or semi-deciduous without affecting the evergreen nature of the forest as whole. The canopy is extremely dense ; it has been demonstrated that apart from the scattered giants which project well above the general canopy, differentiation into definite canopy layers probably does not exist. Epiphytes are numerous, especially Aroids, ferns, mosses and orchids. Climbers vary greatly in amount being sometimes conspicuous but often not so. Ground vegetation in typical cases may be almost absent; elsewhere a carpet of *Strobilanthes* or *Selaginella* and ferns may occur; grasses are absent. The undergrowth is often a tangle of canes, creeping bamboo and palms, which may replace high forest as cane brake along streams. Erect bamboos are unusual but may occur locally. Long cylindrical boles usually with thin smooth bark are typical but plank buttresses are also frequently seen. The leaves are thick and glossy, only rarely pinnate or hairy and are very often white or pink when young. Cauliflory may be relatively common."

Floristics.

I. *Cullenia rosayroana, Palaguium ellipticum, Mesua ferrea, Hopea parviflora, Calophyleum elatum, Vateria indica, Poeciloneuron indicum, Alstonia scholaris, Heretiera papilio, Aglaia roxburghtana. Dysoxylum malabaricum, Canarium strictum, Artocarpus heterophyllus, Bielschmiedia bourdilloni, Pygeum wightianum.*

II. *Agrostislachys lonaifolia, Cyclostemon macrophyllus, Hyndocarpus laurifolia, Acronychia pedanculala, Gomphandra polymorpha, Lansium anamalayanum, Garcinia talbottu, Garcinia xanthochumus, Euphoria longana, Macaranga peltata, Filicium decipiens, Amoora canarna, Myristica malabarica, Canthium dicoccum, Pinanga dicksonii, Caryota urens, Litsea stocksii, Holigarna grahamii, Baccaurea courtallensis.*

II. (a) *Ochlandra criptoria* and *Ochlandra wightii.*

III. *Tabernamontcha hyneanum, Allophyllus cobbe, Clerodendron viscosum, Laportea crenulata, Leea indica. Ixora parviflora. Orophea zeylanica.*

IV. Herbaceous undergrowth consists of *Curcuma angustifolia, Curcuma longa, Zingiber officinale, Girardinia leschenaultiana, Elettaria cardamomum, Strobilanthes* sp. Ferns, mosses and grasses.

V. *Climbers : Calamum* sp., *Entada phaseoloides, Dioscorea* sp.

76. *Natural regeneration.*—Natural regeneration of the important timber species is generally plentiful but usually remains suppressed for lack of opening of the canopy and tending.

77. The tropical rain forest is acknowledged to be a climax formation representing the farthest advance towards a hygrophilous type of vegetation that a locality is capable of supporting. In such a climax formation, gregariousness is usually not prominent due to the great multitude of species present, but may consist sometimes of two or more subdivisions known as "associations". "These are climax communities associated regionally to constitute the formation. The number of associations in a particular formation is naturally determined by the number of sub-climates within the general climate of the formation. Each association is marked by one or more dominants peculiar to it". (Weaver and Clements, 1938).

78. In the evergreen forests of the Anamalais, seven distinct associations can be recognised :

(a) *Hopea—Mesua* association.

(b) *Palaquium—Mesua* association.

(c) *Cullenia—Palaquium* association.

(d) *Mesua—Cullenia* association.

(e) *Hopea—Vateria* association.

(f) *Vateria—Calophyllum* association.

(g) *Poeciloneuron—Cullenia—Mesua* association.

79. (a) *Hopea—Mesua Association.*—This community in which the dominant species are *Hopea parviflora and Mesua ferrea*, occurs in the comparatively drier type of evergreen forests met within the Mount Stuart block. The Karianshola forest is a typical example. The average annual rainfall is 170 centimetres and the elevation varies between 700 metres to 1,050 metres. These forests are essentially post-climax evergreen forests that have resulted on account of favourable edaphic conditions in a rather sheltered situation. Other tree species met within this association are *Vitex altissima, Aglaia roxburghiana, Calophyllum elatum, Elaeodendron glaucum, Syzygium gardneri, Diospyros microphylla, Prosorus indicus, Alstonia scholaris, Dysoxylum malabaricum* and *Bischofia javanica*. The co-dominants characterised by their striking absence in the top canopy are *Palaquium ellipticum, Cullenia rosayroana* and *Poeciloneuron indicum*. At higher elevations, the percentage composition of *Hopea* steadily goes down with *Calophyllum* often taking its place.

80. Both *Hopea* and *Mesua* regenerate profusely. The seedlings remain in a suppresed condition for long periods but respond quickly if sufficient light reaches through the top canopy.

81. (b) *Palaquium-Mesua Association.*—This type is met with frequently in the Punachi Range in regions where the annual rainfall is round about 300 centimetres, at elevations of 750 metres to 1,200 metres. The dominant species are those which give the name to the sub-type. The co-dominants are *Cullenia rosayroana, Heretiera papilio* and *Artocarpus heterophyllus. Hopea parviflora, Vateria indica, Calophyllum elatum* and *Poeciloneuron indicum* are strikingly absent. In regions of higher rainfall or along gentler undulations of shady slopes, *Mesua ferra* falls off in quality and the *Cullenia-Palaquium* association begins to assert itself.

82. " In this association, natural regeneration of *Palaquium ellipticum* is generally more prolific than that of *Mesua* partly because the former seeds almost every year while the latter does not and the seeds of the former are less palatable to rodents and other pests. Moreover, since *Palaquium* is a better shade bearer than *Mesua*, there is a marked tendency for the former to oust the later ". (Venkateswara Ayyar).

83. (c) *Cullenia-Palaquium Association.*—This is the most widely prevalent community in the rain forests of the division and occurs frequently in the Punachi Range The Iyerpadi and Andiparai sholas and the Kadamparai valley are covered by this

association. This type occurs at similar elevations as in the preceding community but in regions with a rainfall ranging from 375 centimetres to 450 centimetres. At elevations above 1,200 metres, it is replaced by the *Mesua-Cullenia* association. This community is essentially a formation occurring on gentlee undulating ground or on shady slopes with comparatively heavy rainfall, but does not tolerate swampy conditions even of a temporary nature.

84. The co-dominants met with are *Mesua ferrea, Calophyllum elatum, Dysoxylum malabaricum, Bichofia javanica* and *Syzygium* species. Of the co-dominants, *Mesua* is in general more preponderant than the rest. The association thrives up to an elevation of 1,200 metres, beyond which *Palaquium* tends to disappear, but *Cullenia* tends to persist in a stunted form along with *Mesua ferrea* and *Calophyllum elatum.*

85. Natural regeneration of both *Cullenia* and *Palaquium* is profuse and advance growth of whippy seedlings occurring in a suppressed condition is clearly visible wherever this community occurs.

86. (*d*) *Mesua-Cullenia association.*—This association occurs at elevations above 1,250 metres up to 1,350 metres beyond which the tropical wet evergreen forest is replaced by the Nilgiri Sub-tropical evergreen type. The slopes above the limit of the Waterfall Estate, the Olear Valley and the upper slopes of the Kadamparai Valley bear this type. The association takes its name from the preponderance of *Mesua* and *Cullenia* over *Palaqulum ellipticum*, the latter often being completely ousted at elevations approaching 1,350 metres. There is usually a mixture of *Calophyilum elatum, Acrocarpus fraxinifolius* and *Machilus macrantha* but the trees are generally stunted and stagheaded. *Hopea, Vateria* and *Poeciloneuron* are distinctly absent from this community. Reeds (*Ochlandra scriptoria*) often inbabit over considerable stretches wherever small streams stagnate for the greater part of the year.

87. (*b*) *Hopea-Vateria association.*—This type is met with along the water courses of the Periyar and Chinnar rivers and its tributaries where the edaphic factors are favourable to the growth of evergreen species. These are essentially riverain formations subjected to periodic flooding. Riverain forests are defined as ' an edaphic formation of river banks dependant upon a constant supply of telluric moisture. Further away on the banks, the vegetation often changes into a *Vateria-Calophyllum* association, but this need not be always. These areas lie at elevations of 500 metres to 750 metres with a rainfall of about 250 centimetres to 300 centimetres. The climate is therefore essentially suited for a semi-evergreen or evergreen formation, but higher up on the slopes the vegetation is entirely moist deciduous kept stable by annual fires.

88. *Vateria indica* is the predominant species often forming a gregarious consociation with a small proportion of other associates (including deciduous species) like *Hopea parviflora, Tetrameles nudiflora, Bischofia javanica, Salmalia insignis, Lagerstroemia, lanceolata* and *Trewia nudiflora*. In certain other localities, *Hopea* occurs almost as a consociation relegating *Vateria indica* and the other associates to an insignificant proportion. There are also instances where a distinct *Hopea-Vateria* association can be identified, where both *Hopea parviflora* and *Vateria indica* from a sizeable proportion of the overwood. These subtle changes in vegetation are probably due to edaphic changes, but as to how they actually cause the variations in species composition is rather difficult to determine.

89. The understorey is characteristic with *Hydnocarpus laurifolia, Olea dioica Vitex altissima* and *Aporosa lindleyana* occurring plentifully with a dense undergrowth of *Tabernamontana hyneanum* and *Glycosmis pentaphylla.*

90. Natural regeneration of *Hopea* and *Vateria* is generally abundant.

91. (*f*) *Vateria-Calophyllum association*.—This type occurs under similar circumstances as in the preceding formation, but occurs at least 5 to 10 chains away from the riverain zone and is therefore not subjected to any flooding. The Manamboli Valley and the small patch of shola forest east of varagaliar elephant camp in compartment 87 of ulandi block are typical examples. This community is also an edaphic formation caused as a result of abundant moisture due to the proximity of perennial water.

92. The gregariousness of *Vateria indica* and *Calophyllum elatum* is clearly prominent and often large specimens up to 4-1/2 metres in girth are discernible. The co-dominants are *Tetrameles nudiflora, Hopea parviffora, Bischofia javanica, Dysoxylum malabaricum, Myristica malabarica* and *Vatica chinensis*. *Mesua, Palaquium* and *Cullenia* are rare. This type is by far the most economic community in the evergreen forest, as both *Vateria* and *Calophyllum* occur in towering heights with almost cylindrical boles and very little defects, thereby giving the maximum out-turn of sleepers.

93. Natural regeneration of *Vateria* is clearly more abundant than *Calophyllum elatum*.

94. (*g*) *Poceiloneurn-Cssemia-Mesua association.—This formation is essentially* confined to the Kallar and Italiar Valleys where the annual rainfall is well over 500 centimetres and the entire region traversed by an extensive network of small streams ever perennial. Large areas in the Kallar Valley which were cleared and handed over to the Cinchona Department are said to have consisted almost entirely of this formation. It is essentially an edaphic climax prevailing under conditions of heavier rainfall, where the soil is inclined to be marshy.

95. Earlier Working Plan Officers have referred to this community as a *Poeciloneuron-Cullenia* association, but enumeration figures conducted by the writer reveal that whereas *Poeciloneuron* forms about 60 per cent of the overwood, *Mesua ferrea* and *Cullenia rosayroana* come next constituting each about 15 per cent of the overwood. Other species in the top storey are *Palaguium ellipticum, Vatica chinensis, Agrostistachys longifolia* and species of *Syzygium*. The writer therefore prefers to call it a *Poeciloneuron-Mesua-Cullenia* association. The percentage of *Poeciloneuron* with its typical plank buttresses is so overwhelmingly pre ponderant over the rest of the species that one might even refer to it as a *Poeciloneuron* consociation. Along water courses and swamps, *Poeciloneuron* forms almost 95 per cent of the overwood with profuse regeneration (all age classes being represented). Outside this community, *Poeciloneuron* is seldom met with anywhere in the division.

96. The understorey is also selective and almost exclusively confined of poles and saplings of *Poeciloneuron Hydnocarpus laurifolia, Garcinia xanthochymus, Mapvia fomentosa* and *Nothopegia colebrookiana*.

97. Along the slopes the percentage of *Poeciloneuron* rapidly falls off, and on the top of the ridge separating the Kallar and Italiar Valleys one has to really search for a specimen of *Poeciloneuron indicum*. In such areas it is clearly a *Mesua-Cullenia* association.

(ix) *Southern wet bamboo brakes*.

98. This is a subsidiary edaphic formation occurring throughout the zone of the tropical wet evergreen forest along streams or on badly drained hollows more or less displacing the tree forest, whilst cane brakes replace them in the wettest sites, In this formation, extensive tracts of reeds occur with only very few, if at all any trees here and there. The few species that occur are mostly evergreen compared to the deciduous species in the moist bamboo brakes. Undergrowth of any other ground flora is excluded and standards are found only occasionally.

Floristics :

I. *Hopea parviflora, Tetrameles nudiflora, Polyalthia fragrans, Vateria indica, Macaranga peltata*, etc.

II. *Ochlandra scriptoria* and *Ochlandra travancoria*. *Ochlandra wightii* is also seen occasionally.

(x) *Nilgiri sub-tropical evergreen forests.*

99. This type is found at elevations above 1,350 metres up to elevations of 1,650 metres in the Punachi and Udumalpet Ranges. Flora typical of this type may be also seen hugging the folds of the ground near ridge tops even at elevations of 1,050 metres. At such high elevations, winds are heavy, the hill slopes are steep and the soil shallow, resulting in a set of conditions certainly not optimum for the best growth of vegetation. The trees are stunted and less shapely. There is a great number of epiphytes on them and the branches appear shaggy on account of mosses and lichens.

100. The species are mainly a selection of those occurring in the temperate forest above and in the moist tropical forest below. Champion considers this formation to be of a transitional nature between the tropical and the temperate vegetational types.

Floristics :

I. *Calophyllum elatum, Mesua ferrea, Actinodaphne hookeri, Cinnamomum sulphuratum, Elaeocarpus serratus, Elaeocarpus tuberculatus, Syzygium* species.

II. *Litsea stocksii, Michelia nilaginica, Symplocos spicata, Canthium dicoccum. Ilex denticulata.*

II (*a*) *Teinostachyum beddomei*

III. Thickets of *Strobilanthes, Gaultheria fragrantissima, Viburnum* sp., *Rubus* sp., *Hypericum mysorense*, mosses and ferns.

(xi) *Southern wet temperate forests.*

101. The southern wet temperate forests are confined to the upper reaches of the hills in the Punachi and Udumalpet Ranges at elevations above 1,650 metres. This type consists typically of vast stretches of grass and interrupted by numerous, isolated, compact small woods or *sholas* in the more sheltered sites or depressions and composed of stunted evergreen trees of little economic value. The annual rainfall in these areas varies from about 500 to 750 centimetres received from both the monsoons.

102. The *sholas* may be described as a ' high elevation stunted evergreen wood the trees rarely attaining 15 to 18 metres in height. The crowns are usually dense and rounded with dark green coriaceous leaves which tend to be red to a varying degree when young giving a range of colours particularly conspicuous during spring. The branches are loaded with mosses, ferns and other epiphytes, and woody climbers are common. There is no distinct division into different canopies, but a continuous series from under-shrubs and shrubs to the large trees. There is a considerable admixture of species, pure crops of even moderate extent being absent, species belonging to the natural orders *Myrtaceae, Lauraceae and Styraceae* generally being well represented

103. The grass lands get dry and inflammable from February-March and the greater part of them are burnt annually. These fires have unquestionably exerted a very great influence in the present distribution of the fire tender evergreen forest. Each fire eats in a little all along the periphery of the shola and the extent of these sholas are gradually getting reduced year by year. Heavy winds sweep over these grasslands during the south-west monsoon period. These winds are also an important factor in the development of these sholas since their effects are quite obvious in the form of the trees.

Floristics of sholas :

I and II. *Syzyaium* species, *Michelia nilagirica, Symplocos spicata, Euonymus crenulatus, Ilex denticulata, Rhododendron arboreum, Mahonia leschenaultii, Cinnamomum wightii. Eurya japanica. Ternstroemia gymnanthera, Evodia lunu-ankenda, Meliosma wightii, Hydnocarpus alpina, Rhamnus wightii, Viburnum erubescens, Photonia notoniana, Humboldtia* species.

II. (*a*) *Indocalamus wightianus* (reed bamboo), *Teinostachyum beddomei*.

III. *Gaultheria fragrantissima, Berberis tinctoria, Hypericum mysorense, Rhodomyrtus tomentosa, Oldenlandia stylosa, Oldenlandia articularis, Lasianthus venulosus, Lasianthus coffeodies, Schofflera racemosa, Vernonia monosis, Alsophila latebrosa* (tree fern), *Dodonaea viscosa*.

IV. *Osbeckia wightiana, Strobilanthes kunthianus, Strobilanthes sessilis, Eupatorium glandulosum, Arisaema leschenaultii, Calanthe veratrifolia, Polygonum* species, *Rumex* sp., and a great wealth of ferns and mosses.

V. *Climbers : Eleagnus kologa, Rubus ellipticus, Rubus racemosus, Rubus moluccanus.*

Floristics of grass lands—

I. The chief grasses are *Themeda cymbaria, Cymbopogon polyneuros, Ischaemum indicum, Bothriochloa pertusa* and *Eragrostis nigra*. Associated plants are *Lobelia nicotinifolia, Leucas suffruticosa, Anaphalis lawii, Fimbristylis uliginosa.*

II. At certain places, *Cytissus scoparius, Eupatorium glandulosum, Hypericum mysorense, Rhodomyrtus tomentosa* and *Gaultheria fragrantissima* may be also seen.

104. The ecological study of the shola-grasslands formation has been a subject of searching study on which there has been so far no agreed conclusion. The *sholas* are a stable plant community in equilibrium with the climatic and edaphic factors in the depressions. As far as the *sholas* alone are concerned, there is no difference in opinion on the assertion that they represent the climatic climax of the locality. About the ecological status of the grasslands, several conflicting theories have been put forward on similar formations occurring over extensive areas in the Nilgiris.

105. Champion in his ' Preliminary Survey of the forest types of India and Burma ' is inclined to think that the grasslands are a sub-climax, mainly caused by the indiscriminate clearing of the temperate forests in the past, the prevailing regime of periodic fires preventing the restoration of these areas into forests again. This theory does not explain why a stable formation of grassland should be established in an area blessed with plentiful precipitation by repeated burning alone, when such treatment of old clearings by hill-tribes under similar locality factors has not led to such vast grassy meadows elsewhere but is always associated with some form of secondary scrub.

106. According to another theory put forward by Ranganathan in his working plan for the Nilgiris, the grassland is not secondary to a previously existing forest climax, but must be regarded as a climatic climax itself, the natural factor mainly responsible for the formation of this type being frost. This theory has not been accepted by many authors including Bor as the presence of a dual climax in the same locality is not an accepted phenomenon in the standard systems of ecology.

107. Jeyadev in his working plan for the Nilgiris, while admitting the possibility of small fringes of grasslands with scrubby growth along the borders of *sholas* having resulted due to the action of periodic fires, considers that over extensive areas where the grasslands hold sway, the ecological status of such areas should be considered to be a pre-climax mainly conditioned by factors such as frost, exposure to winds, lack of sufficient moisture and poor drainage. According to him the final stage of succession resulting in the formation of *sholas* could only reach in the sheltered cool, moist sites in the folds of the rolling hills where these limiting factors cannot operate.

108. Of these three theories, the last one seems to be the most acceptable to the Punachi Grass Hills for the chief reason, that a major portion of the area consists of extremely shallow soil over underlying rock as reflected by the outcrop of rocks, thereby preventing the cycle of progression to continue. Such shallow soiled grasslands are said to occur in Ceylon over extensive areas under the name of ' patenas '. Heavy winds prevalent in the locality also act as a check on the spread of tree growth. This has also been proved by the repeated failure of artificial regeneration in the Grass Hills, in most cases the plants having died after having been established over one or two years,

apparently due to the shallowness of the soil and the heavy winds. In the Konalar Valley proper where alone the soil is fairly deep, heavy winds during the south-west monsoon and frost during winter appear to be the chief limiting factors.

SECTION 2—INJURIES TO WHICH THE CROP IS LIABLE.

100. *Winds.*—Strong westerly winds during the south-west monsoon period cause some damage to the younger plantations by breaking the terminal shoots or uprooting the entire plant in addition to dispersing seeds of weeds belonging to the Compositae. In the evergreen selection coupes, considerable damage is often caused by winds during the south-west monsoon period following coupe working. In the Grass Hills where the winds are particularly ferocious, the seedlings are often made to rotate with the result the earth around the collar separates itself in the form of a ring loosening gradually the root system and making room for water to seep in resulting in rotting of the roots. In the dry season, the dry easterly winds also help to some extent in spreading forest fires.

110. *Fires.*—Fires are common in the deciduous forests during the dry season killing younger regeneration and rendering conditions favourable for the invasion of coarse grasses. The fire season in the division is from the end of January to the end of April, when most of the deciduous trees have shed their leaves. Crown fires as such are rare; invariably all the fires that occur are ground fires which creep along the ground burning leaves and grass and cause little damage to saplings and trees, but periodically destroy young regeneration.

111. In the Grass Hills, extensive areas are burnt annually. Fires do not generally pass through sholas, but where the latter adjoin grassland, the margins of sholas are often scorched by grassland fires and trees are sometimes killed.

112. The statement below gives the extent of damage done by fires within the division between 1951 and 1963 :—

Year.	*Range.*	*Number of fires during the year.*	*Total area burnt in hectares.*	*Cost of fire protection*	
(1)	(2)	(3)	(4)	(5)	
				RS	P.
1951	Pollachi	22	2,250	..	
	Tunacadavu	18	9,970	3,087	60
	Punachi	8	2,386	450	00
	Udumalpet	18	810	..	
1952	Pollachi	11	320	..	
	Tunacadavu	9	690	2,984	11
	Punachi	10	3,347	558	69
	Udumalpet	19	384	..	
1953	Pollachi	11	231	..	
	Tunacadavu	16	9,928	3,985	75
	Punachi	14	1,419	664	25
	Udumalpet	5	125	..	
1954	Pollachi	6	205	..	
	Tunacadavu	19	4,815	4,117	56
	Punachi	6	523	205	00
	Udumalpet	18	492	..	
1955	Pollachi	26	660	..	
	Tunacadavu	20	3,865	4,002	50
	Punachi	9	1,541	516	61
	Udumalpet	12	453	..	
1956	Pollachi	17	650	..	
	Tunacadavu	13	855	1,527	75
	Punachi	14	3,608	494	00
	Udumalpet	14	592	..	
1957	Pollachi	18	231	..	
	Tunacadavu	9	415	1,505	25
	Punachi	8	1,075	480	69
	Udumalpet	6	198	..	

Year. (1)	*Range.* (2)	*Number of fires during the year.* (3)	*Total area burnt in hectares.* (4)	*Cost of fire protection.* (5) RS.	 P.
1958	Pollachi	12	120	..	
	Tunacadavu	2	60	2,402	37
	Punachi	4	281	546	37
	Udumalpet	13	315	..	
1959	Pollachi	28	1,131	..	
	Tunacadavu	29	2,829	2,383	00
	Punachi	14	1,913	581	00
	Udumalpet	21	1,025	..	
1960	Pollachi	11	326	..	
	Tunacadavu	2	280	2,443	63
	Punachi	4	287	515	06
	Udumalpet	8	133	..	
1961	Pollachi	20	429	..	
	Tunacadavu	8	1,112	1,986	62
	Punachi	14	265	600	50
	Udumalpet	11	237	..	
1962	Pollachi	18	231	..	
	Tunacadavu	2	202	2,694	00
	Punachi	12	155	509	79
	Udumalpet	18	379	..	
1963	Pollachi	27	321	..	
	Tunacadavu	..	..	2,500	00
	Punachi	9	584	672	24
	Udumalpet	23	414	..	

113. *Drought.*—Periodic drought due to failure of monsoons is one of the chief causes of failure of artificial regeneration in the thorn forests of Udumalpet and Pollachi Ranges. During certain years the drought is particularly severe with practically no precipitation for a number of months following the north-east monsoon. This causes large failures in the fuel regeneration areas of Udumalpet Range sometimes resulting in even complete failures. Notwithstanding damage from termites (described later) which affect only small seized seedlings of *Eucalyptus* hybrid, this species in particular suffers heavily from drought; even established plants 3 to 4 years of age are found to die as compared with the comparatively hardier indigenous fuel species which thrive somehow or other once they pass through the first year's summer. In the Sethumadai Section of Pollachi Range, damage from drought is normally not associated with any of the indigenous fuel or timber species, as the area is blessed with quantitatively more rain received from both the monsoons, notwithstanding the other initial advantages which the plants get from repeated weedings and soil-workings done through the aegis of *kumri*. Despite all this, sporadic deaths from drought is noticeable in *Eucalyptus* hybrid in established plantations of even five to six years of age. In patches of shallow or rocky soil, the plants often dry *en masse*.

114. When the drying was first noticed, a doubt arose whether this could be due to some insect or fungal attack. A careful examination of the root, stem and collar of several dead and dying trees did not reveal any insect contamination at any point. To rule out the possibility of fungal infection, the writer sent the specimens to the Government Mycologist, Agricultural College and Research Institute, Coimbatore, who after careful examination found them to be associated with the fungi, *Sclerotium* and *fusarium*. As these are fungi omnipresent in the soil, further investigations had to be therefore conducted to determine whether the drying was due to any pathological infestation of these fungi. Accordingly, a number of poles of *Eucalyptus* hybrid in different stages of drying in the Ayerangal and Gudaravalli plantations were selected and classified under the following three categories:—

(*i*) Plants showing the first signs of drying.

(*ii*) Plants in a little more advanced condition of drying.

(*iii*) Plants in an advanced stage of drying.

115. On the advice of the Mycologist, a wettable solution (1 gram in 1 litre of water) of wet Ceresan, one of the latest fungicides said to have great sensitivity to the fungi noted above, was applied at intervals of ten days by drenching the soil around the selected plants. In all three applications were made, but no improvement was noticed in the condition of any of the plants. On the contrary, a couple of months later it was observed that several of the untreated plants found to be drying during a previous inspection were found to be healthy after the north-east monsoon rains. This gave the clue that drought must have been possibly the real cause. In order to establish this fact a few seedlings of *Eucalyptus* hybrid from the Ayerangal nursery were sent to the Agricultural College, Coimbatore, and subjected to pathogenicity tests by the same fungi cultured under laboratory conditions, but none of the seedlings took the infection. The Mycologist has therefore categorically stated that the drying of the trees cannot be associated with any pathogenic organisms. The above experiments therefore seem to corroborate the presumption that drought has been the possible cause for the death of established plants of *Eucalyptus* hybrid.

116. *Injurious plants.—Lantana* is a menace in the deciduous forests of the division and rapidly invades places where the canopy is open forming an impenetrable mass in two or three years' time. Where the canopy is dense it does not flourish, but a few plants may subsist here and there, from which a rapid spread is initiated with the opening of the canopy and badly suppresses any natural regeneration that may occur. It is also a regular pest in all worked fuel coupes as well as in the teak and fuelwood plantations.

117. *Eupatorium odoratum* is another pest in the teak plantations of the division. It's seeds are easily disseminated by the monsoon winds and rapidly spreads throughout the plantation.

118. *Strobilanthes* of various species infest the evergreens hindering natural regeneration to some extent. *Artemisia vulgaris* is another weed which colonises openings in the evergreen forest. It appears to have been introduced as a hedge plant in the estates around Valparai by the planting community, but has now run wild. It is particularly a menace in the *Eucalyptus grandis* plantations raised in the areas reclaimed from the Cinchona department.

119. The climbers, *Butea parviflora, Butea superba, Acacia pennata* and *Acacia concinna* do some damage in the deciduous forests and plantations. In the fuel areas, *Acacia intsia* and *Pterolobium indicum* are the worst offenders often completely smothering coppice regeneration. They form dense thickets causing much inconvenience in getting about the forest. In the evergreens, *Entada phaseoloides, Calamus* sp., and *Gnetum scandens* are the common climbers.

120. Elephant grass (*Imperata cylindrica*) occurs in swamps in the moist deciduous forests and indicates ill drained areas unsuitable for teak planting. Such areas are difficult to regenerate even with other species on account of heavy infestation of grass.

121. Although an understorey of bamboos in the older teak plantations may be desirable in the interests of greater productivity, bamboo regrowth in the younger plantations is particularly harmful as it completely smothers regeneration. It has been therefore the policy to discourage bamboo in teak plantations. Bamboo flowering, either sporadic or gregarious always spells danger to the forests from fire during the succeeding dry season.

122. *Fungi.*—The fungus *Uncinula tectonii* sometimes attacks the leaves of teak in young plantations, but not to any serious extent.

123. *Animals.*—Wild elephants cause plenty of damage to growth both in the plantations as well as in the natural forest particularly in areas which they habitually haunt, as where there is a good growth of bamboos or where their favorite swamp or salt lick is in the neighbourhood. Elephants also cause considerable havoc to *kumri* crops raised in the regeneration areas all over the division. Wild boars are harmful to

younger regeneration. Gaur which feed mainly on grass seem to do more damage to regeneration by trampling than by browsing. Porcupines, bats, monkeys, flying squirrels, and rodents consume large quantities of fruits and seeds of shola trees and thereby adversely affect regeneration of these species.

124. *Insects.*—The defoliators (*Hyblaea puera*) and skeletonisers (*Hapalia machaeralis*) of teak do a certain amount of damage to the teak plantations almost annually though not in epidemic form. The loss in annual increment on account of defoliation has been estimated to be about one third of the total increment even during the epidemic, but since this seldom happens, the loss is not much. Besides loss of increment, the attack is also said to be responsible in some instances of the destruction of the terminal bud resulting in forking and production of epicormic branches.

125. No adequate control measures have yet been devised against these pests which must be considered as normal risks of planting pure teak. At present the only control appears to be from natural parasites of these pests. A research wing of the Entomology Branch of the Forest Research Institute, Dehra Dun, which functioned at Topslip until March 1963, has established that the teak defoliators have a number of natural parasites preying on all the three developmental stages, viz., egg, larva and pupa. More than 30 insects belonging mainly to the families, *Braconidae*, *Tachinidae*, *Ichneumonidae* and *Mantidae* have been listed. Of these, *Cedria paradoxa* has been quoted as the most important.

126. Sporadic damage from the teak canker grub, *Dihammus cervinus* is noticed in the 2nd and 3rd yers generally at the collar causing partial girdling and injury to the the 2nd and 3rd years generally at the collar causing partial girdling and injury to the cambium inducing an increased growth of wood of callus around the wound. As a result of the continuous overgrowth in the callus, a globular canker sometimes twice the diameter of the stem is formed. Most of the damage is done near ground level but cankers are occasionally formed as high as one metre above the ground. In the case of extensive tunnelling by the larvae, the stem is so much weakened that it breaks off. Damage by this pest is not serious, as the affected seedlings can be cut back.

127. The *Ailanthus* defoliator, *Eligma narcissus* is at times a serious pest in the softwood plantations often assuming epidemic proportions soon after the north-east monsoon has abated. It also occurs to a lesser extent on *Ailanthus triphysa*. The plants are often completely defoliated, seedlings and younger saplings being seriously affected. Several insecticides have been tried against it, but all of them have proved to be ineffective. The larvae after avidly feeding on the leaves, pupate in large numbers on the trunk of the plant, and at present the only method of destroying this pest is by mechanically removing the pupae and burying them in a small pit at the base of the plant. It is also observed that some form of biological control is also exercised on it by certain micro-organisms (probably bacteria), and large numbers of caterpillars are found to rot and die naturally during certain seasons. With more detailed investigation on this, it may be perhaps possible to control it biologically by artificially releasing the parasites.

128. Sporadic damage to young plants of *Salmalia malabarica* by the shoot borer, *Tonica niviferana* is in evidence in both the nurseries and the younger plantations.

129. In the evergreens, both *Mesua ferrea* and *Poeciloneuron indicum* are badly damaged by a *Buprestid borer—Chrysochroa sp.* The larvae attack standing living trees. Outwardly, the trees do not show any deleterious effect due to the borer attack except slight exudation of resinous sap at different places on the bole. But when the trees are felled and converted they are found completely riddled with large galleries in the heartwood rendering considerable lengths of the tree useless for sleeper conversion. The infested trees can be easily identified by the heaps of wood-dust which get collected on the ground near the base of the tree.

130. Cockchafers and wire-worms are common pests in nurseries of all species, especially if the nursery is located in the same place for more than one year. Ants (*Formicidae*) are particularly harmful in nurseries of *Eucalyptus* hybrid. They eat the seeds resulting in low germination percentage. They are being effectively prevented by mixing one teaspoonful of Folidol to a bucketful of water and spraying the solution on each bed before sowing. A couple of sprayings after sowing is also made until germination is complete.

131. Termites attack *Eucalyptus* hybrid both in the nursery as well as in the plantation stage. Small seedings and saplings are girdled at the root, the plants often dying completely. Older plants survive the girdling as they outgrow the damage. The damage is particularly severe in drier regions, where the termites are able to form subterranean galleries before attacking the plants. The damage is minimised by application of 25 grams of 10 per cent Heptachlor, Aldrin or Chlordane dust to the pit just before planting.

132. *Grazing.*—Grazing is widely prevalent in the Pollachi and Udumalpet Ranges. Grazing apart from being inimical to regeneration, is largely responsible for the spread of fires. Grazing alone has been largely contributory for the reduction in wild life in this division despite elaborate restrictions on shooting. Animal diseases such as anthrax, foot and mouth and rinderpest are transmitted by infected cattle to wild life often ending fatally. Elephants are susceptible only to anthrax, but the ungulate population are susceptible to all the above hree diseases.

133. *Man.*—Man is directly responsible for the degradation of forests through illicit removal of fuel, timber, bamboos and other forest produce. Illicit removal of forest produce is rare in the Tunacadavu Range and negligible in the Punachi Range, but in Pollachi and Udumalpet Ranges, such offences are considerable.

134. The statement given below furnishes the nature and extent of forest offences in the division between 1953–54 to 1962–63.

STATEMENT OF FOREST OFFENCES IN COIMBATORE SOUTH FOREST DIVISION BETWEEN 1953–54 TO 1962–63.

Year.	*Range.*	*Illicit cutting or removal.*	*Illicit grazing.*	*Illicit shooting.*	*Timber transit rules.*	*Miscellaneous.*	*Total.*	*Compounding fees collected.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
								RS.	P.
1952–53	Pollachi ..	156	3	1	17	1	178	1,764	50
	Tunacadavu ..	..	3	..	..	..	3	106	00
	Punachi ..	42	1	..	..	2	45	1,021	00
	Udumalpet ..	106	2	2	2	10	122	3,204	00
1953–54	Pollachi ..	80	1	..	9	1	91	737	00
	Tunacadavu ..	2	1	..	..	..	3	21	00
	Punachi ..	41	7	1	..	2	51	1,143	50
	Udumalpet ..	123	7	..	19	12	161	2,878	00
1954–55	Pollachi ..	101	4		10	..	115	2,158	00
	Tunacadavu ..	..	..		..	..	..	..	
	Punachi ..	58	2	..	..	1	61	1,032	00
	Udumalpet ..	105	2	2	10	18	137	3,424	00
1955–56	Pollachi ..	83	5	..	13	3	104	2,268	00
	Tunacadavu ..	2	1	..	..	..	3	32	00
	Punachi ..	36	2	2	1	1	42	2,079	00
	Udumalpet ..	99	9	1	9	19	137	3,050	00
1956–57	Pollachi ..	141	9	..	9	4	163	1,926	50
	Tunacadavu ..	3	..	..	..	..	3	18	00
	Punachi ..	50	6	1	..	..	57	1,434	00
	Udumalpet ..	149	9	1	6	12	177	2,433	00
1957–58	Pollachi ..	134	3	..	31	11	179	2,150	00
	Tunacadavu ..	..	..	..	..	..	..	..	
	Punachi ..	98	13	1	2	4	118	2,399	50
	Udumalpet ..	188	12	..	10	8	218	3,625	00
1958–59	Pollachi ..	135	14	..	5	7	161	1,364	00
	Tunacadavu ..	1	..	..	..	..	1		
	Punachi ..	84	4	..	2	3	94	1,751	00
	Udumalpet ..	157	6	1	1	5	170	1,760	00

STATEMENT OF FOREST OFFENCES IN COIMBATORE SOUTH FOREST DIVISION BETWEEN 1953–54 TO 1962–63—*cont.*

Year.	*Range.*	*Illicit cutting or removal.*	*Illicit grazing.*	*Illicit shooting.*	*Timber transit rules.*	*Miscellaneous.*	*Total.*	*Compounding fees collected.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
								RS.	P.
1959–60	Pollachi ..	94	10	..	15	1	120	1,693	00
	Tunacadavu ..	3	..	..	..	..	3	30	00
	Punachi ..	123	8	2	2	..	135	2,365	00
	Udumalpet ..	128	9	..	2	2	141	2,090	00
1960–61	Pollachi ..	128	6	..	29	3	166	2,176	00
	Tunacadavu ..	..	..	..	..	..	..	..	
	Punachi ..	89	2	2	1	3	97	710	50
	Udumalpet ..	144	8	3	1	5	161	2,561	00
1961–62	Pollachi ..	143	17	..	8	5	173	1,760	00
	Tunacadavu ..	2	2	..	8	1	13	787	50
	Punachi ..	75	..	1	5	..	81	1,372	00
	Udumalpet ..	131	7	1	..	39	178	2,670	00
1962–63	Pollachi ..	155	17	1	12	3	188	2,697	00
	Tunadacavu ..	2	4	..	3	..	9	248	75
	Punachi ..	98	4	..	6	3	111	3,312	00
	Udumalpet ..	167	15	1	..	10	193	3,275	00

SECTION 3—FAUNA.

135. The Anamalais exhibit a rich and varied fauna and most of the South Indian species are well represented. Elephants, gaur, tigers, panthers, sloth-bear, deer, wild boar, wild dogs, porcupine, black-naped hare, flying squirrel, jackals, common langur and the Nilgiri langur, pangolins, civet cats, etc., are observed. The moist deciduous forests are usually richer in faunal variety and abundance than any other forest type and practically all the animals mentioned above are well represented at all times. Large game animals like the gaur, barking deer and the spotted deer do not resort to the evergreen forests except for cover. Elephants resort to it only in the dry season, but where there are reeds of any extent, elephants can be met with at all seasons. The evergreens harbour the melanistic variety of the panther which preys on langur. The dry deciduous and thorn forests are characterised by a general dearth of water during most of the year except along a few major rivers. The spotted deer which is more tolerant of unfavourable moisture conditions is one of the fairly typical denizens of such tracts, as are the barking deer, the wild boar, the jackal, the porcupine and the sloth bear Of the larger carnivores, the panther is more frequently found in this type of forest, than the tiger which usually prefers the moister and deeper woods. During the monsoon months, when favourable moisture conditions prevail, certain of the larger animals more typical of the moist deciduous forests such as the elephant, sambhur and gaur wander into the dry deciduous areas. The Nilgiri Tahr or the sportsmen's ' ibex ' is restricted to the grassy slopes and precipitous crags on the ridges and peaks along the high hills. The Manjampatti valley of Udumalpet Range is alone said to harbour the legendary ' White bison '. Attempts made by the writer to locate it have proved futile. It seems probable that what was observed as the ' White bison' by some forest officer in the past must have been quite likely a comparatively lighter coloured gaur specimen, since the existence of a white bison, has not been authenticated so far by any auhority on wildlife.

136. *Reptiles.*—Among snakes of special interest occurring in the forests of this division, mention may be made of the cobra, the hamadryad, the keeled viper, the Anamally viper and the Russell's viper, all of which are poisonous. Of these, the Hamadryad is restricted to the moist deciduous and evergreen tracts. Pythons are plentiful in the drier tracts. There are a host of non-poisonous snakes also. Of the other reptiles, the Indian Monitor is common in the evergreens as also the beautiful black and yellow tortoise. Crocodiles are present only along the Amaravathi, Periyar and Chinnar rivers.

137. *Birds.*—The division abounds in a variety of birds. The moist deciduous forests are usually richer in birds than any other forest type just as they are in ground animals. Typically the avifauna of most deciduous forests consists of birds like the Racket-tailed Drongo, Red-whiskered Bulbul, Black-headed Oriole, Tree pie, Grey Malabar Hornbill, Painted Partridge, Shama, Whisting Thrush, Paradise Fly-catcher, Emerald Dove, Spotted Dove, Green Pigeon, Hill Myna, Blue Jay, Jungle Babbler. Tickell's Flower-pecker, Green Barbet, Crow pheasant, Golden backed Woodpecker and the Rufus Woodpecker, Rose-ringed and Blue winged Parakeets, Crested Hawk. Crested Serpent-Eagle and those well known game birds the Grey Jungle Fowl and the Spur Fowl.

138. The dry deciduous and thorn forests are equally rich in avian population, the typical birds being shrikes, Red-vented Bulbul, Indian Robin, Black Drongo, Green Barbet, Purple-rumped Sun-bird, Spotted Dove, Kestrel, Jungle Babbler, Pea-fowl, Baya Crested Hawk, Grey Jungle Fowl, Partridge, besides birds commonly met with in and around habitation such as the Common Myna, Kites, Parakeets, Blue Rock Pigeon, various fly catchers, etc.

139. The evergreens harbour avifauna in much lesser abundance compared to the other types. Characteristic birds are the Whistling Thrush, Crested Eagle, Jerdon's Chloropsis, Grey Hornbill and the Ped Hornbill, Crested Eagle, Jerdon's Chloropsis, Hill-Myna, Black-naped Oriole, etc. Most of these birds can be seen in the moist deciduous forests as well.

140. The typical feathered fauna of the wet temperate forests are the Nilgiri Whistling Thrush, Palni Laughing Thruhs, Jerodn's Chloropsis, Bonellis Eagle, Red-headed Merlin, Small Minivet, Hill Myna, Large Barbet, Nut thatches, Tits, etc.

141. The Amaravathi and the Aliyar Dams are the only two irrigation dams in the division whose consrtuction has been completed at the time of writing this plan. The reservoirs of these two dams are frequented by a number of feathered inhabitants such as the Pond Heron and the Grey Heron, the Little Cormorant, and the Large Cormorant, the Cattle Egret, White breasted King Fisher, Yellow-wattled Lapwing and the Common sand piper. Of these, the more common water birds such as the Cattle Egret and the Pond Heron are commonly observed along the principal canals. When the construction of the other irrigation dams of the Parambikulam-Aliyar Project is completed, it is expected that there will be a great increase in the number of water-birds

142. *Fishes.*—The reservoirs abound with a great varitey of fishes, the rearing of which is handled by the Fisheries Department. Catla, Rohu, Mrigal, Labeo, Mahseer and Cat fish are some of the fishes reared. In addition to these, a great variety of smaller fishes exist naturally in the reservoirs and in the perennial rivers flowing through the forests. The Konalar river which traverses the Grass Hills is managed by the Konalar Fishing Association. The Rainbow Trout is reared in this river by the association.

143. *General.*—That there has been a considerable reduction of wild life in this division, particularly among the larger ground animals is a fact which is undisputed. This despite the complete ban of shooting imposed in the Tunacadavu Range since 1958, combined with the strict issue of game licences even elsewhere may appear rather paradoxical. Since 1963, the entire division has been closed to shooting. The reasons for decrease in wild life are not difficult to seek. As many as six dams are under construction in connection with the Parambikulam-Aliyar Project, and the dumb denizens are just tossed to and fro on account of large scale disafforestation to accommodate the resulting reservoirs, camp sites, power-houses, etc. Blasting of rock day and night at regular intervals cause panic to wild animals which are generally timid. It is quite possible that this could seriously disturb matind and gestalion of animals

144. Grazing too has taken its toll of wild life by being contributory to the spread of fires as also the transmission of fatal cattle diseases such as anthrax, foot and mouth and rinder-pest to the ungulate population. These diseases are common to all the Ungulates (whether wild or domestic) and the poor unprotected wild ones have no other alternative but to succumb to the disease once they are infected.

CHAPTER III—UTILISATION OF THE PRODUCE.

SECTION 1—AGRICULTURAL CUSTOMS AND WANTS OF THE POPULATION.

145. Agriculture is still the chief occupation of the rural population. During recent years, several industries have been established in and around the towns of Pollachi and Udumalpet, but these concerns, dependant as they are on hydro-electric power, have no direct bearing on the forests, except that the large staff employed need firewood for domestic use.

146. Both dry and wet crops are grown within the region. In areas served by irrigation, paddy and sugarcane are the two main crops and two crops of paddy are usually raised during the year. Such areas are those fed by the Amaravathi system in the Udumalpet and Dharapuram taluks. Of the chain of dams proposed to be constructed under the Parambikulam—Aliyar Project, only the Aliyar Dam is complete at the time of writing this plan and water is now being let out to irrigate portions of Pollachi taluk. With the completion of this project, a large area in Pollachi, Udumalpet, Dharapuram and Palladam taluks will come under irrigation to facilitate raising of both dry and wet crops.

147. In areas not fed by any river irrigation system, the chief source of water for agricultural uses has always been from wells. The rapid expansion of rural electrification to practically all the villages in the region has enabled the thrifty and industrious local population to use cheap hydro-electric power for lifting well water for purposes of irrigation. This has enabled the ryots to deepen wells to a depth where bullocks cannot ordinarily be used for lifting water and thereby obtain larger supplies. Areas thus served are normally subjected to dry cultivation. The chief dry crops raised in the region are groundnut, cotton, *ragi* (*Eleusine coracana*), *Cholam* (*Sorghum vulgare*) and tobacco. In the Pollachi taluk, the land in the neighbourhood of the reserves is particularly rich and the climatic conditions are favourable for the production of two dry crops in the year. The total rainfall is not high, but both the monsoons are felt. In the Udumalpet taluk, dry crops can be raised only once in the year.

148. In the planting country around Valparai, tea has been planted extensively, although coffee and cardamom are also grown on a smaller scale. Cinchona is cultivated over small areas in the Kallar and Kadamparai Valleys by a separate department of the Government.

149. There has been a tremendous increase in the population of the tract during the last decade. The census figures of 1951 and 1961 for Pollachi, Dharapuram and Udumalpet taluks given below will confirm this fact.

Name of taluk. (1)	*Total population as per 1951 census.* (2)	*Total population as per 1961 census.* (3)
Pollachi	3,84,677	4,27,084
Udumalpet	1,90,442	2,20,679
Dharapuram	3,23,307	3,26,346

150. The increase is also felt by the ever expandnig needs for forest produce by the population of which only a fraction is met by the forests of this division.

151. *Hill tribes.*—There are a number of hill tribes within the division. They are the *Kadars*, *Malasars*, *Malai Malasars*, *Pulayars*, *Muduvars* and *Eravalars*. Several of these hill-tribes have been settled within the forests with large areas set apart for each settlement within which they practice shifting cultivation. *Ragi* is the crop usually raised by these hill-tribes and the seeds are sown in April–May after burning the slash. The grain is harvested in September or October. This practice has been made use of by the department at Mount Stuart and Lower Punachi in raising teak successfully by the method of *Kumri* with the dual object of minimising regeneration costs as also to gradually wean the hill tribes from the evil habit of shifting cultivation, but had to be given up later. In the Tunacadavu Range, *Kumri* had to be given up even as early as in the late forties due to the difficulty in protecting the *ragi* crop from wild elephants, whereas in Lower Punachi, *Kumri* is still practised to-day although much of it is done by plainsmen on account of the general apathy of hill-men for hard work.

152. *Wants of the population.*—The chief demands of the population are for timber for railway sleepers, building and construction, small timber for agricultural implements, fuel and charcoal for domestic consumption and cottage industries such as lime and brick kilns, pottery and jaggery manufacture, bamboos for the paper industry as well as for domestic consumption, various kinds of minor forest produce, pasture and penning facilities. There is also a small demand for manure leaves.

(*a*) *Timber.*—The chief species usually in demand are *Tectona grandis*, *Dalbergia latifolia*, *Terminalia paniculata*, *Terminalia tomentosa*, *Pterocarpus marsupium*, *Lagerstroemia lanceolata*, *Grewia tiliaefolia*, *Adina cordifolia*, *Cordia dichotoma*, *Artocarpus hirsuta* and *Artocarpus heterophyllus*, *Radermachera xylocarpa* and *Albizzia odoratissima*. The greatest demand for large sized timber is from Government departments such as the Railways, Public Works Department, Electricity Board, Industries and Jails. The demand is mostly for teak which is being used rather indiscriminately for all types of work even where lesser types of wood would have fulfilled the purpose. As the best timber is to be reserved for Government use, practically all the better types of logs are set apart for such use. The rest of the timber is utilised to meet the public demand. The requirements of large sized timber by the public is ever on the increase on account of great demands for building construction largely necessitated by various housing and industrial schemes in the urban areas. Similar is the case with small timber for rural housing. Considerable quantities of large sized teak and rosewood are also in demand for the furniture industry which is monopolised mainly by settlers from the West Coast.

(*b*) *Railway sleepers.*—Apart from timber in the log form, large quantities of wooden sleepers are required by the Railways. In addition to *Mesua ferrea*, several evergreen species such as *Calophyllum elatum*, *Poeciloneuron indicum*, *Hopea parviflora*, *Vateria indica*, *Cullenia rosayroana*, *Canarium strictum* and *Palaquium ellipticum* are now accepted by the Railways. About 20,000 Broad Guage units are now contracted to be supplied to the Railways annually from this division. This is just a fraction of the probable demand, but even then the forests are unable to bear the burden. Even now additional coupes are being worked every year in order to fulfil the targetted quantity.

(*c*) *Small timber.*—The requirements of small timber for agricultural implements are quite large. The plough-share and the handle, the shaft and the yoke, spokes and felloes, axles and struts have all got to come from the forests and forests alone as there are no unreserves worth the name. The same is the case with small timber for rural housing and fencing. Most of the harder woods such as *Mesua ferrea*, *Hopea parviflora* and *Anogeissus latifolia* are preferred for axle boxes and plough shares while teak continues to be in demand as before for spokes and felloes. Other articles such as the yoke, handle, struts, etc., are met with from various other miscellaneous species such as *Terminalias*, *Grewia tiliaefolia*, *Cordia dichotoma*, *Lagerstroemia lanceolata*, *etc.*

(*d*) *Teak Poles.*—Teak poles are in great demand from the State Electricity Board for use as electric transmission posts. Due to the expanding rural electrification programme set afoot in the State, the demand for electric transmission poles is great and only a tiny fraction of this demand is presently met with. There is also considerable demand for teak poles of smaller dimensions for telephone posts, scaffolding, piling, construction of sheds and *pandals*, etc.

(e) *Fuel.*—There is a good demand for fuel in the towns of Pollachi, Udumalpet and Dharapuram and the city of Coimbatore. Only a fraction of the local demand is met with from the forests of this division, the rest coming largely from the Government and private forests in the adjoining state of Kerala. Unlike what it was a decade ago, there is now a fair demand for fuel even in the villages due to the gradual depletion of tree growth over the countryside.

Consequent to the advent of the Parambikulam, Aliyar Project and the Parambikulam-Aliyar Hydel Scheme, a number of settlements of staff and labour have been established at several places within the reserves. These settlers require fuel and in order to prevent possible pilfering, a nominal sum of 2 naye paise per day is being collected from each mazdoor for collection of deadwood from the forests. The staff of the Parambikulam-Aliyar Project as also the staff of private firms engaged in engineering contract works for the project have also been permitted the supply of firewood from the nearest clearfelling coupes at a cost of Rupees 10 per ton exclusive of the cost of collection and transport. Since these settlements are mostly temporary, the demand will cease with the completion of the Parambikulam–Aliyar Project.

(f) *Bamboos.*—There is a keen demand for bamboos of all sizes, both in the villages and in the towns. The uses to which bamboo is put are innumerable and it may be said that there is no other plant which renders as much service to man as the bamboo. It is used extensively in place of timber for roofing, scaffolding in the construction of temporary bridges, housing, fencing, basket-making, mat-making and in the making of a variety of agricultural and domestic implements. In addition to these conventional needs, large quantities of bamboos produced in the division are now needed for the production of paper. The Seshasayee Papers and Boards, a 50 ton capacity private paper factory was established in 1961 at Pallipalayam near Erode, with the object of producing paper and boards primarily from bamboos obtained in the forests of the State. Large quantities of bamboos are required by this concern annually. Since 1962–63, 75 per cent of the bamboos exploited in the annual coupes of this division have been earmarked for supply to this paper factory. This is only a fraction of the total demand by the industry, but nevertheless it has resulted in the diversion of a considerable quantity of bamboos hitherto utilised for local needs.

(g) *Minor Forest Produce*—Honey, wax, gallnuts, reeds, canes, Rela (*Cassia fistula*) bark, Avaram (*Cassia auriculata*) bark, Soapnut (fruits of *Sapindus emarginatus*), Tamarind, *Shekoy* (pods of *Acacia concinna*), *Perpodal* (fruits of *Trichosanthes cucumerina*), Ginger and turmeric, black and white dammer, and *Nellikai* (fruits of *Emblica officinalis*) are the chief minor forest produce in demand.

The demand for cardamom and lemon grass (*Cymbopogon flexuosus*) has decreased greatly during the past 3 or 4 years and there is a considerable fall in prices. The essential oil distilled from lemon grass was at one time in great demand in western countries for the production of perfumes and cosmetics. Export of adulterated stuff and the gradual replacement of the natural oil by synthetic products have been the main cause for the reduction in demand.

For the past few years, *Rouwolfia serpentina* has evoked international interest as the alkaloids derived from its roots have been found to have sedative effects and useful in the treatment of high blood pressure. The species occurs only sparsely in the moist deciduous forests of the division. Regular cultivation of this species on some scale appears to be a necessity in view of the demand created by its medicinal significance.

There is also some demand for Usil (*Albizzia amara*) leaves for use as a cleansing agent. The leaves are dried and powdered and mixed with *Shekoy* powder. The mixture is then used for scrubbing oil smeared over the body.

(*h*) *Manure leaves.*—There is some demand for green leaf manure in the Pollachi Range mainly from the ryots of Anamaali, Vettaikaranpudur and Kottur. The demand is mostly for the leaves of *Wrightia tinctoria*. In accordance with G.O. Ms. No. 2928, Development, dated 27th July 1950, the fuel coupes in the division are kept open for free removal of manure leaves by the ryots for one year prior to their felling.

(*i*) *Grazing.*—A large number of cattle graze in the forests of this division. The forests of Pollachi and Udumalpet Ranges are the areas affected most as they are the most proximal to the plains. The Tunacadavu Range is closed to grazing except for domestic cattle. The following statement gives the average annual number of cattle which usually graze in the Pollachi, Punachi and Udumalpet Ranges. The average annual incidence of grazing in each of these ranges is also given. This has been worked out taking into account the closure of felled fuel coupes and regeneration areas for a period of five years after felling or regeneration and areas permanently closed to grazing.

STATEMENT SHOWING THE GRAZING DETAILS IN THE COIMBATORE SOUTH FOREST DIVISION

	Average annual number of cattle grazed. *Cow units.*	Grazing incidence per cow unit. *Hectares.*
(1)	(2)	(3)
Pollachi	10,108	1·02
Punachi	488	5·62
Udumalpet	14,925	3·42

(*j*) *Penning.*—There is a fair demand for penning inside the reserves. This is permitted. About 2,000 cow units pen in the Pollachi Range every year and some 5,000 cow-units in the Udumalpet Range. In the Punachi Range, only about 250 cow-units are penned annually.

SECTION 2.—MARKETS AND MARKETABLE PRODUCTS.

153. *Markets.*—(a) *Pollachi.*—Pollachi is the chief market for the forest produce of the division. Contractors in Pollachi, Tunacadavu and Punachi Ranges maintain their depots here for the sale of timber and other forest produce to the local population and for sale to retail dealers in Coimbatore, Kallai and other places. The weekly shandy at Pollachi on every Thursday is perhaps the biggest in South India. The shandy does not have any direct significance on sale of forest produce as such, as only agricultural produce is sold, but nevertheless it attracts large number of businessmen from all over South India.

The division maintains a Government Timber Depot at Pollachi to which all departmentally extracted timber is transported for sale. The auction sales at the depots are attended by timber merchants from all over South India.

Both timber and fuel exploited within the division face severe competition from similar produce obtained from the adjoining State of Kerala. The Kerala State also maintains a timber depot of its own at Pollachi. The competition is particularly severe for the past 2 or 3 years as large areas are being cleared in the submergible areas of the Parambikulam-Aliyar Project. Apart from this, extensive forests are also being cleared annually in the Kerala State for raising teak plantations. So much so, there is at present a glut in the timber market at Pollachi particularly in respect of miscellaneous woods. Despite this heavy intake, teak and rosewood still continue to have a demand as the total requirements in respect of these two species still exceeds the supply. Consequent to the influx of large quantities of timber and fuel to Pollachi, dozens of new timber depots have sprung extending even beyond the municipal limits of the town. Several new saw mills have been established. There are at present 15 saw mills in the town.

The State Industries Department has recently set up a seasoning plant at Pollachi. The plant enables private timber merchants to season their timber at reasonable costs. A charge of one rupee per cubic foot is presently being levied. The seasoning plant has helped to a certain extent in the popularisation of miscellaneous timbers in place of teak and is bound to play a more useful part in the future with greater publicity for its activities.

The position of fuel at Pollachi is even worse than that of miscellaneous timbers. The price per metric tonne of fuel presently ranges between Rupees 28 and Rupees 40 which works out to even below the total costs incurred by contractors on payment of royalty, extraction and transport. Nevertheless, contractors bid for coupes with the hope of making up the loss, in the sale of timber or by sale of fuel at a later date with profit.

(b) *Coimbatore.*—Next to Pollachi, Coimbatore is an important market for the sale of forest produce exploited within the division. The city with its average annual consumption of about 1 lakh metric tonnes of fuel consumes bulk of the firewood output of the division. Timber sold locally at Pollachi or in the depot auctions are purchased by Coimbatore merchants for retail sale within the city.

(c) *Udumalpet.*—Next to Pollachi and Coimbatore, Udumalpet stands as a market of some importance for the sale of forest produce. Contractors of coupes in the Udumalpet Range hail from here and maintain depots in the town for the sale of timber and other forest produce to the local population and for sale to retail dealers at Dharapuram and other places.

(d) Dharapuram, Vettaikaranpudur and Anamalai are also markets of some importance where timber, bamboos and fuel are sold to local consumers.

154. *Marketable products.*—(a) *Timber*—With the advent of seasoning and preservative treatment, practically every species of timber is saleable. Teak and rosewood are the two timber species which however have the greatest demand. Rosewood logs of 1.83 metres girth and over without any major defects are considered to be of shipment quality and attract buyers from the west-coast who ship them to Switzerland and Italy, where they are said to have a good demand for the production of decorative veneers. Apart from these two, other species such as *Terminalia paniculata, Terminalia tomentosa, Lagerstroemia lanceolata, Pterocarpus marsupium, Grewia tiliaefolia, Radermachera xylocarpa, Cordia dichotoma, Artocarpus hirsuta, Artocarpus heterophyllus* and *Albizzia odoratissima* also have a good demand either when sold in the log form or as sawn sizes. *Mesua ferrea*, can be sold to the Railways in the form of sleepers. *Hopea parviflora* and *Vateria indica*, can also be supplied as sleepers, but since these species have a greater demand when sold in the round, they are generally not utilised for sleeper supply. Rejected sleepers and porotes of sleeper species also find a ready sale. There is also a keen demand from the match industry for softwood species such as *Salmalia malabarica, Evodia lunu-ankenda, Vtaeria indica, Alstonia scholaris, Machilus macrantha and Ailanthus excelsa.*

(b) *Teak poles.*—Teak poles of the required specifications for use as electric transmission posts are readily acceptable by the Electricity Board whose demands are more than the division can supply. The rest find a ready market if they are at least three metres in length and 20 centimetres in girth.

(c) *Fuel.*—Although the current prices for firewood at Pollachi alone are slightly lower than usual on account of the prevalent glut for reasons mentioned earlier, no difficulty is experienced in marketing the produce owing to sustained demand from other parts of the district as also from outside.

(d) *Bamboos.*—With the diversion of 75 per cent of the bamboo output of the forests to the paper factory at Pallipalayam, the rest of the quantity left is just a fraction of the total demand, and is therefore readily marketable almost anywhere.

(e) *Minor Forest Produce.*—Among the minor forest produce collected in the division, Tamarind, Honey, Wax, Gallnuts, *Shekoy*, Soapnut and Canes are readily marketable. Canes in particular find a ready market at Coimbatore which has an established *rattan* industry. Cardamom and lemon grass have gone down in demand owing to fall in the export market. The other lesser known minor forest produce have only a fair demand.

SECTION 3.—LINES OF EXPORT.

155. *Railways.*—The Southern Raiway metre guage line connects Pollachi and Udumalpet with Olavakkot and Coimbatore and also with the eastern and southern districts. The Railways mainly serve in transporting wooden sleepers from Pollachi Timber Depot to the creosoting plant at Olavakkot in Kerala. There is some transport of timber and fuel by rail, but this is quite insignificant when compared to that by road, as the latter is generally favoured by the public on account of its efficiency and quicker service. Delay in the availability of railway wagons and in the actual transport has been largely responsible for the Railways falling into disfavour by the public, although by and large, rail transport is decidedly cheaper than by road.

156. *Roads.*—All the important centres of working in the division are connected by road to Pollachi or Udumalpet which form the two main centres of distribution and sale of forest produce. The construction of the Ulandi Valley road which was suggested in the last working plan was taken up by the department in 1955, and completed in 1958, thereby opening up the potentially rich Ulandi Valley for exploitation and further development. This road connects Mount Stuart with Manthirikottai via Anaigundi covering a distance of 27.56 kilometres. In addition to this road, a number of small roads of lesser importance have been constructed by the Public Works Department in connection with the Parambikulam-Aliyar Project during the past few years, so that several other areas also have been rendered accessible. However, large tracts of forests particularly in the Udumalpet Range, viz., the Pundi–Mavadup plateau and the Thalinji–Manjampatti Valleys are still inaccessible for want of proper communications.

157. With the reorganisation of States in 1956 and the consequent transfer of the Thekkadi leased forests to the Kerala State, the corresponding portions of the Mount Stuart Ghat Road, the Topslip–Anaipadi Short-cut Road and the Dawson Road lying within this region had to be handed over to the new State. With the advent of the Parambikulam–Aliyar Project, the Adivaram Road and the Sethumadai—Topslip portion of the Mount Stuart Ghat Road have been handed over to the Public Works Department, and the Aliyar–Gundrao Road to the State Electricity Board, for better maintenance on account of the increase in traffic. Negotiations to hand over the Ulandi Valley Road also to the Electricity Board are currently afoot. It is proposed to hand over this road only temporarily for widening the road to enable transport of heavy machinery to the power house proposed to be set up along the banks of the Parayankadavu River in the Manamboli Valley.

158. *Proposed road from Meenmuttipallam to Chinnar.*—A road from Meenmuttipallam connecting the Ulandi Valley Road with some of the younger teak plantations of the Ulandi Valley has been progressively constructed during the past few years in order to enable extraction of timber and fuel from the clearfelling coupes. A further alignment connecting this road to Chinnar has been recently completed early this year and construction over a portion of the length is presently on. This road when completed will serve to transport timber and other forest prdouce from the submergible areas in the Chinnar Valley as also from the areas proposed for conversion into teak in this region.

159. *Right to use roads in the Anamalai plantations.*—The Forest Department and its contractors have a right to use all roads and paths made by the planters in the Anamalais. Should forest produce be transported by or on behalf of the Forest Department over any such road or path, a contribution towards its maintenance shall be paid by the department, the amount of which may be decided by mutual agreement or by the Collector.

The following statement shows the more important roads in the region which are used in the transport of forest produce :—

	Name of the road. (1)	*Authority maintaining the road.* (2)	*Areas served.* (3)
1.	Pollachi—Sethumadai Road.	Highways Department.	Serves the Tunacadavu and Pollachi Ranges.
2.	Dawson Road.	Forest Department	Serves for transport of forest produce from the Pollachi Range.
3.	Adivaram Road (Sethumadai old Road)	This is a forest road, but since 1960, it is being maintained by the Public Works Department	Serves for transport of fuel and bamboos from the Ayerangal and Pachathanni Series of Pollachi Range.
4.	Uppar-Kaliapuram Road	Kaliapuram Panchayat Union	Serves for transport of fuel and bamboos from the Pachathanni Series of Pollachi Range.
5.	Navamalai Road	Public Works Department	Serves the Kottur Fuel Series of Pollachi Range.
6.	Mount Stuart Ghat Road (Sethumadai-Topslip-Sungam Road)	This is a forest road, but since 1960, a portion of the road lying between Sethumadai and Topslip is being maintained by the Public Works Department	Serves for transport of all forest produce from Tunacadavu Range to the plains. Also serves some of the fuel and bamboo series in Pollachi Range.
7.	Topslip—Anaipadi Short cut Road (formerly known as the Topslip-Tellikal Road)	This is a forest road, but since 1960, it is being maintained by the Public Works Department	Serves for transport of forest produce from the Tunacadavu Range.
8.	Seechali Road	Forest Department	Serves for transport of thinned produce from the teak plantations in the Seechali Valley of Tunacadavu Range.
9.	Ulandi Valley Road	Forest Department	Serves for transport of all forest produce from the Tunacadavu Range.
10.	Manamboli—Sholayar P. H. No. 1 Road	Electricity Board	Serves bamboo and sleeper coupes in the Manamboli Valley.
11.	Pollachi—Valparai Road	Highways Department	Serves the Pollachi and Punachi Ranges. Tea planters in the Anamalais have extensions of the road into their estates.
12.	Aliyar—Gundrao Road	This is a forest road, but since 1962, it is being maintained by the State Electricity Board	Serves the Lower Punachi teak plantations and bamboo series in Punachi Range.
13.	Valparai—Sirukundra Road	Tea Estates Company (Private) Limited	Serves for transport of sleepers from the Kallar and Italiar Valleys.
14.	Sirukundra—Cinchona Road.	Cinchona Department	Serves for transport of sleepers from the Kallar and Italiar Valleys.
15.	Udumalpet—Chinnar Road	Highways Department	It is the main transport road in the Udumalpet Range linking Chinnar on the Kerala frontier with Udumalpet.
16.	Amaravathi Road	Public Works Department	Serves fuel areas in the Udumalpet Range.
17.	Pallapalayam—Tirumurthinagar Road	Public Works Department	Serves fuel areas in the Udumalpet Range.
18.	Kallapuram—Manthorai Cart track	This is a forest road, but it is being maintained by the Kallapuram Panchayat Union	Serves fuel areas in the Udumalpet Range.
19.	Amaravathi—Valanthurai Road	Kallapuram Panchayat Union	Serves fuel areas in the Udumalpet Range

SECTION 4—METHODS OF EXPLOITATION AND THEIR COST.

160. *Timber.*—All hardwood timber from the clearfelling coupes in the Tunacadavu Range is exploited departmentally and transported to Pollachi Depot for sale. Prior to 1958–59, softwood species such as *Salmalia malabarica, Evodia lunu-ankenda, Machilus macrantha, Alstonia scholaris, Vateria indica,* etc., were also extracted departmentally and transported to Pollachi Depot for sale, but the present practice is to sell them standing, since departmental working with its inevitable delays will result in quick deterioration of such timber.

161. The annual coupe is surveyed and demarcated on the ground in accordance with the working plan map or other instructions if any. Enumeration, marking and numbering are completed usually by December previous to the year of felling. Trees are numbered at foot and at breast height. Felling is normally commenced in April and is executed by axemen from Kerala and local malasars. Logging, squaring, snouting and drag holes are done at stump-site by the felling mazdoors who are paid for these operations by the cubic foot. Exceptionally large logs are sawn longitudinally to facilitate dragging and transport. All the logs are chisel numbered on conversion. The year of felling, coupe number, species, tree number, a letter indicating whether the log is the butt, second or third log, etc., of a tree, the depot number and a letter or number indicating quality are chiselled on each log. The volume of each log is calculated by the quarter girth formula, girth being measured at the centre, under bark. Dragging to road side depots is done by departmental elephants which also help to load exceptionally large logs on to lorries. The timber is transported from the roadside depots to the sale depot at Pollachi by lorries through the agency of a contractor.

162. Teak is generally converted with bark on except at the centre where it is debarked for purposes of measurement. With the exception of *Lagerstroemia lanceolata* which is offered for sale with bark on, all other miscellaneous timbers are debarked and dressed square, leaving the corners rounded. This appears to be wasteful utilisation as only defective logs are worth squaring in order to present a better appearance. Rosewood is dressed round removing all sapwood so as to expose the colour of the heartwood.

163. The following classification is adopted for teak timber in the Coimbatore South division :—

Quality classification.—

A—Logs without knots, cracks, splits, etc.

B—Logs with slight defects such as bends, knots, etc.

C—Poor quality logs.

Length and girth classification (for teak and rosewood only)—

ALI—A class logs over 15 feet (4.5 metres) in length and over 60 inches (152 centimetres) in girth.

ALII—A class logs over 15 feet (4.5 metres) in length and 48 to 59 inches (122 to 150 centimetres) in girth.

ALIII—A class logs over 15 feet (4.5 metres) in length and 36 to 47 inches (91 to 119 centimetres) in girth.

ASI—A class logs 8 to 15 feet (2.4 to 4.5 metres) in length and over 60 inches (152 centimetres) in girth.

ASII—A class logs 8 to 15 feet (2.4 to 4.5 metres) in length and 48 to 59 inches (122 to 150 centimetres) in girth.

ASIII—A class logs 8 to 15 feet (2.4 to 4.5 metres) in length and 36 to 47 inches (91 to 119 centimetres) in girth.

BI—B class logs over 60 inches (152 centimetres) in girth.

BII—B class logs 48 to 59 inches (122 to 150 centimetres) in girth.

BIII—B class logs 36 to 47 inches (91 to 119 centimetres) in girth.

CI—C class logs of over 60 inches (152 centimetres) in girth.

CII—C class logs of 48 to 59 inches (122 to 150 centimetres) in girth.

CIII—C class logs of 36 to 47 inches (91 to 119 centimetres) in girth.

NOTE.—Length is not taken into consideration in the case of B and C class logs, but all logs below 8 feet (2.4 metres) in length irrespective of the quality are included in the C class.

All teak logs below 36 inches (91 centimetres) in girth are classified as CIV irrespective of quality or length. Rosewood logs above 72 inches (18.3 centimetres) in girth and 6 feet (1.83 metres) and over in length if sound and without defects are treated as 'shipment quality'.

Classification of species other than teak and rosewood:

AI—A class logs of over 60 inches (152 centimetres) in girth.

AII—A class logs of 48 to 59 inches (122 to 150 centimetres) in girth.

Logs below 48 inches (122 centimetres) in girth are included in the B class.

NOTE.—Length is not taken into consideration in the classification of miscellaneous species.

164. The prevailing felling rates for departmentally exploited timber in the Tunacadavu Range are given below :—

	RS. P.	
Teak, round	0·12	per cubic foot.
Teak, squared	0·24	per cubic foot.
Rosewood, round, dressed to heartwood	0·24	per cubic foot.
Junglewood, round	0·12	per cubic foot.
Junglewood, squared	0·24	per cubic foot.
Venteak, round, with bark	0·12	per cubic foot.
Longitudinal sawing :—		
Logs of 120 to 150 cubic feet	0·75 to 1·25	per cubic foot.
Logs of 151 to 175 cubic feet		
Logs of 176 to 200 cubic feet		
Logs of 201 to 225 cubic feet		
Logs of 226 to 250 cubic feet		
Transport charges from Tunacadavu Range to Pollachi Depot.	1·19	per cubic foot.

165. The costs of dragging during the last 5 years are given below. These figures have been worked out by charging the total expenditure on elephants against the quantity of timber dragged. Overhead expenditure such as the pay and allowances of the Forester in-charge of elephants and the Forest Veterinary Officer, Coimbatore have not been included in these calculations :—

Year. (1)	*Dragging cost.* (2) RS. P.
1958–59	0·18 per cubic foot.
1959–60	0·17 per cubic foot.
1960–61	0·33 per cubic foot.
1961–62	0·20 per cubic foot.
1962–63	0·13 per cubic foot.

166. After removal of all timber considered saleable, softwood trees left standing in the coupe and lop and top ends of hardwood species left over as unsuitable for conversion into timber are sold in auction separately. The contractor who puchases the right to collect lop and top ends, fells and billets all the stuff left behind into firewood and small timber. Billets below 92 centimetres in girth are not permitted to be removed as they are required for providing a good burn to the regeneration area. The work is done on piece-work contract by labour recruited mostly from Kerala. Rates paid vary from Rs. 8 to Rs. 10 per metric tonne of fuel which includes loading into lorries also. Defective and unsound logs or trees left behind as unsaleable material is often extracted by the lop end contractor as saleable material thereby calling for sounder utilisation on the part of the department. Elephants are often employed by the contractor for dragging such timber and loading them into lorries. The contractor may maintain his own elephants or most often they are hired from Kerala. Some of the agriculturists of Vettaikaranpudur who have lands adjoining the reserved forest capture and maintain elephants which are hired to contractors. The charges for a hired elephant vary from Rs. 40 to Rs. 50 per elephant per day in addition to feeding charges. Labour

for felling, conversion, dragging and loading into lorries are paid by the cubic foot. Exploitation of softwood trees is also done similarly. The following rates are prevalent :—

(i) Felling and conversion—18 paise per cubic foot.

(ii) Dragging to road-side—20 paise per cubic foot.

(iii) Loading in lorries—10 paise per cubic foot.

(iv) Transport to sale depot—1 paisa per cubic foot per kilometre.

(v) Unloading at sale depot—3 paise per cubic foot.

167. It will be seen that these rates are generally higher than departmental rates. This is inevitable as the maximum amount of labour has to be mustered by the contractor to complete the exploitation within the lease period.

168. The transport of fuel and timber from the top end coupes in the Tunacadavu Range is by lorries to Pollachi where the contractors have their sale depots for retail sale. The contractors may maintain their own lorries as is most often the case or sometimes extra lorries may be hired. The transport costs vary from Re. 1 to Rs. 1-50 per lorry load per kilometre.

169. The engaging of mazdoors and supervision is entrusted to 2 or 3 agents who are paid at a rate of Rs. 150 per month.

170. *Railway sleepers.*—The evergreen forests of Punachi Range are worked under the selection system for the production of railway sleepers. Until 1961-62, the exploitation was entirely through contractor's agency. The trees enumerated in the annual coupe were felled by the contractor and the specified number of sleepers were rendered by the contractor who was paid at pre-specified rates fixed by inviting tenders.

171. The following statement gives details of the rates paid to the sleeper contractor from 1954-55 to 1960-61 for different species of sleepers :—

Year of working. (1)	*Species.* (2)	*Rates paid.* (3)	*Remarks.* (4)
		RS. P.	
1954-55	*Mesua and Calophyllum elatum*	13·37 per Broad Guage sleeper. 6·50 per Metre Guage sleeper.	
1955-56	*Mesua ferrea*	13·00 per Broad Guage sleeper. 6·37 per Metre Guage sleeper.	
1956-57	*Calophyllum elatum*	13·00 per Broad Guage sleeper. 6·50 per Metre Guage sleeper.	
1956-57	*Mesua ferrea and Calophyllum elatum* ..	12·44 per Broad Guage sleeper. 6·25 per Meter Gauage sleeper. 4·25 per Narrow Guage sleeper.	
1957-58	*Mesua ferrea and Calophyllum elatum*	12·14 per Broad Guage sleeper. 6·25 per Meter Guage sleeper. 4·25 per Narrow Guage sleeper.	
1958-59	*Mesua ferrea*	11·28 per Broad Guage sleeper. 5·66 per Metre Guage sleeper. 4.00 per Narrow Guage sleeper.	
1958-59	*Calophyllum elatum, Cullenia rosayroana Canarium strictum*	8·94 per Broad Guage sleeper. 4·00 per Metre Guage sleeper. 3·12 per Narrow Guage sleeper	
1959-60	*Mesua ferrea*	11·90 per Broad Guage sleeper. 5·87 per Metre Guage sleeper. 3·90 per Narrow Guage sleeper.	
1959-60	*Palaquium ellipticum, Calophyllum elatum Cullenia rosayroana, Canarium strictum.*	9·25 per Broad Guage sleeper. 4·45 per Metre Guage sleeper. 3·25 per Narrow Guage sleeper.	
1960-61	*Mesua ferrea*	17·87 per Broad Guage sleeper. 5·81 per Metre Guage sleeper. 3·77 per Narrow Guage sleeper.	
1960-61	*Calophyllum elatum, Canarium strictum, Cullenia rosayroana*	8·19 per Broad Guage sleeper. 4·15 per Metre Guage sleeper. 2·90 per Narrow Guage sleeper.	
1960-61	*Cullenia rossyroana*	[illegible]·21 per Broad Guage sleeper. 4·79 per Metre Guage sleeper.	

Remarks.—The two different sets of rates paid for the same species are for two different contractors.

172. The lop and top ends, and wind fallen and damaged trees were sold in auction separately during the succeeding year. With effect from 1962–63, the method of working was modified so as to provide for felling of the trees departmentally. Under this system, the conversion of timber into sleepers is entrusted to a contractor who is required to quote the total quantity of timber required for producing the targetted quantity of sleepers (including rejections) and a lump-sum amount for conversion, transport to Pollachi rail-head depot, spreading for passing, fixing clamps and loading into railway wagons for the entire quantity of sleepers. The required quantity of timber is extracted departmentally and supplied to the contractor. Porotes and offcuts obtained in the process of conversion are handed over to the sleeper contractor, while the top ends of felled trees are converted departmentally into fuel stacks and sold.

173. The costs of extraction of railway sleepers during 1962–63 under this method are given below :—

Item of work. (1)	*Rate per broad guage unit.* (2)
	RS. P.
Felling charges	0·82
Dragging to saw-pit	1·37
Cost of conversion, transport to Pollachi rail-head depot, spreading for passing, cutting ends, fixing clamps and loading into wagons	7·88
Overheads like pay, dearness allowance, etc., for one Forester and one Forest Guard ..	0·13
Formation of roads and feeder roads within the coupe	0·41
Allowance for rejections at 10 per cent ..	1·06
Total cost of production per Broad Guage unit.	11·67
Cost of converting lop and top ends into fuel stacks	6·67 per stack of 2·04 cu. metres.

174. During the same year, sleepers were also extracted entirely by departmental agency from windfalls and a portion of the area outside the working circle. Transport to Pollachi rail-head depot, fixing clamps and loading into wagons were alone given on contract. The cost of extraction per Broad Guage unit by this method works out as follows :—

Item of work. (1)	*Rate per Broad Guage unit.* (2)
	RS. P.
Felling charges	0·42
Dragging to saw-pit	0·83
Conversion into sleepers	3·75
Hire charges for saws	0·09
Transport to Pollachi rail-head Depot, spreading for passing, cutting ends, fixing clamps, and loading into wagons	3·94
Formation of roads	0·64
Construction of sheds	0·03
Over heads	0·13
Allowance for rejection at 10 per cent ..	0·98
Total cost of production per Broad Guage unit.	10·81

175. *Teak poles.*—At every thinning a teak plantation is subjected to, all saleable produce that is obtained is converted and sold. The thinned produce is converted into poles. Top ends and miscellaneous poles are left in the forest.

176. For the first two thinnings which are mechanical, the trees in the lines meant for cutting, viz., the alternate diagonal or the alternate planting lines as the case may be, are felled and converted at a flat rate of 4 paise per pole. For the subsequent thinnings which are silvicultural, the trees are marked by the District Forest Officer or his Assistant. The marked trees are felled and converted into poles adopting the classification given below. Poles suitable for electric transmission posts are extracted separately according to the classification fixed by the Forest Utilisation Officer which is given below :—

Classification of poles for supply to the Electricity Board :—

(i) Long posts	8·5 to 9·1 metres in length, with a bottom girth of 75 centimetres and a top girth of 45 centimetres.
(ii) Special length posts	6·7 to 7·3 metres in length, with a bottom girth of 65 centimetres and top girth of 32·5 centimetres.
(iii) Top pieces	3·0 to 4·3 metres in length, with a bottom girth of 52·5 centimetres and a top girth of 45 centimetres.
(iv) Bottom pieces	4·3 to 4·9 metres in length, with a bottom girth of 45 centimetres and a top girth of 32·5 centimetres.

Classification of poles for sale in the open market—

Poles below 30 centimetres in girth at butt-end.

Poles above 30 centimetres and below 45 centimetres in girth at butt-end.

Poles above 45 centimetres and below 60 centimetres in girth at butt-end.

Poles above 60 centimetres and below 75 centimetres in girth at butt-end.

Poles above 75 centimetres and below 90 centimetres in girth at butt-end.

NOTE.—Poles above 90 centimetres in girth at butt end are treated as logs and converted according to the classification given for timber.

177. After conversion, the poles are dragged to the road-side depots by mazdoors and stacked classwise. Elephants are sometimes used for dragging in the older plantations where longer lengths and larger girths are encountered. The prevalent rates for marking, felling, conversion and dragging poles are given below. It may be observed that uniform rates have been paid for felling, conversion and dragging for all categories of poles, exempting electric transmission poles for which enhanced rates were paid.

Item of work. (1)	*Rate.* (2)
	RS. P.
Marking for thinning	0·37 per acre.
Felling	0·09 per pole.
Conversion and dragging to roadside depots..	0·21 per pole (ordinary).
Conversion and dragging to roadside depots..	1·00 (for electric transmission poles only).

NOTE.—The rates paid for extraction of logs (poles above 90 centimetres in girth) are the same as noted in paragraphs 164 and 165.

178. *Fuel and small timber.*—The method of extraction of fuel and small timber in the simple coppice and plantation coupes of Udumalpet, Pollachi and Punachi Ranges is through the agency of contractors as per the general practice in vogue all over the State.

179. The annual coupe is surveyed and demarcated on the ground in accordance with the working plan map. Each coupe is divided into two or more strips according to its size. Felling commences serially from strip I. The contractor first proceeds to clear the undergrowth and fell all coppice and tree growth except reserved trees flush with the ground. The fuel and small timber are then billetted and stacked in sizes of 1.83 metres × 1.22 metres × .91 metres approximating to nearly 1.50 metric tonnes in weight. In the Lower Punachi Series where some quantity of big timber is obtained, the logs are dragged to the road-head after conversion. Brushwood and faggotwood of small dimensions occurring in the coupe are sold by the contractor to the local populace for removal under cover of head-load permits.

The following are the exploitation charges currently prevalent:—

Item of work. (1)	*Rate.* (2)
	RS. P.
Felling undergrowth and trees, billetting and stacking into sizes of 1·83 metres x 1·22 metres x ·91 metres (for fuel and small timber only) ..	5·25 per stack of 1·5 metric tonnes.
Felling timber trees occurring in the coupe, conversion, rough squaring and dragging to road-head	14·00 per cubic metre.
Transport of fuel and small timber from coupe to sale depot including loading and unloading charges at either end	1·25 per lorry load of 5 metric tonnes per kilometre.
Transport of big timber from coupe to sale depot including loading and unloading charges at either end	3·26 per cubic metre per kilometre.

180. In addition to the above expenditure, one or more agents are maintained by the contractor for each coupe for engaging mazdoors, supervision of work and issue of permits. The agents are paid on a monthly basis. The salary varies from Rs. 100 to Rs. 150 depending on the size and value of the coupe.

181. *Bamboos.*—The exploitation of bamboos in the division is also through the agency of contractors. Bamboo coupes are sold in auction as annual leases on a three year felling cycle. The coupes are worked by the contractors under the supervision of one or more agents who engage labour for collection of bamboos. Each agent is paid a salary varying from Rs. 100 to Rs. 150 depending on the size and value of the coupe. Bamboos are extracted in different sizes according to the local classification which is noted below and dragged in bundles of 15 to 25 to the road-side depots, and transported to the sale depots at Pollachi and Udumalpet for retail sale. Dead bamboos which cannot be utilised as whole are split and tied into bundles for sale as fuel. A small quantity of green bamboos are also split for sale as fencing material in addition to thorns which are primarily used for fencing.

182. The following statement gives details of the classification adopted for bamboos and the current rates paid by bamboo contractors for felling, collection, dragging and transport for each class of bamboo :—

STATEMENT SHOWING THE COLLECTION AND TRANSPORT CHARGES FOR VARIOUS CLASSES OF BAMBOOS.

Local name.	*Species.*	*Description of size.*	*Measurements.* *Girth in centimetres.*	 *Length in metres.*	*Felling, collection and delivery charges at road-side depot.*	*Transport charges.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					RS. P. Each.	RS. P. Each.	
1. *Valai* ..	*Bambusa arundinacea.*	Bottom piece.	35 to 50	4·6 to 5·5	0·75	0·55	
2. *Mathurai poottu.*	Do.	Do.	20 to 25	3·0 to 3·5	0·20	0·20	
3. *Vettukai* ..	*Bambusa arundinacea.*	Bottom piece.	12·5 to 20	3·0 to 3·4	0·10	0·12	
4. *Kadai poottu.*	Do.	Do.	15 to 18	3·0 to 3·4	0·10	0·08	
5. *Odai* ..	Do.	Top piece.	25 to 30	3·7 to 5·5	0·20	0·42	
6. *Kanniodai* ..	Do.	Do.	20 to 25	3·7 to 5·5	0·15	0·25	

STATEMENT SHOWING THE COLLECTION AND TRANSPORT CHARGES FOR VARIOUS CLASSES OF BAMBOOS—*cont.*

Local name.	*Species.*	*Description of size.*	*Measurements.*		*Collection and delivery charges at road side depot.*	*Transport charges.*	*Remarks.*
			Girth in centimetres.	*Length in metres.*			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					RS. P. Each.	RS. P. Each.	
7. *Valkol* ..	*Bambusa arundinacea.*	Top piece.	15 to 18	3·0 to 3.4	0·10	0·08	
8. *Pachi* ..	*Dendrocalamus strictus.*	Bottom piece.	7·5 to 12·5	3.7 to 4·6	0·05	0·10	
9. *Vedarkol* ..	Do.	Do.	15 to 18	3·0 to 3·4	0·10	0·12	
10. *Dabbai (splits).* ..	Both species.	Do.	15 to 18	2·4 to 3·1	0·69 per bundle.	0·39 per bundle.	

183. *Exploitation of bamboos for mill supply.*—From 1962–63, 75 per cent of the output of bamboos in the coupes of Tunacadavu Range are earmarked for supply to the paper mills at Pallipalayam. Heavy bottom pieces (*Valai*) and other varieties of bamboos considered unsuitable for domestic or rural use are generally set apart for mill supply. Bamboo coupes of Pollachi, Punachi and Udumalpet Ranges are not targetted for such supply as the available quantity is limited, since bulk of the bamboos in these three ranges have flowered and died during the last decade. The targetted quantity for mill-supply from the Tunacadavu bamboo coupes is estimated before the coupes are put up for sale and specified in the sale agreements for fulfilment by the contractors. The contractor is paid at a rate of Re. 0.35 per mile for good roads and Re. 0.40 per mile for bad roads for each metric tonne of air-dried bamboos transported from the bamboo coupe to the mill site at Pallipalayam. These rates are fixed by the Chief Conservator of Forests. In addition, an amount of Rs. 31.50 per metric tonne of air-dried bamboos has been fixed by the Chief Conservator of Forests for realisation from the mill towards cost of collection and payment of royalty to the Government. The collection charges per metric tonne of bamboos from each bamboo coupe is fixed by the Conservator of Forests, the difference between this figure and the total amount of Rs. 31.50 being credited to Government as royalty. The transport and collection charges are paid to the contractors directly by the mill on delivery of each consignment of bamboos while the royalty is paid direct to the District Forest Officer.

184. The following statement gives details of the transport and collection charges fixed for mill supply from the bamboo coupes of Tunacadavu Range during 1962–63 and 1963–64 :—

Year.	*Name of coupe.*	*Transport charges per metric tonne.*	*Collection charges per metric tonne.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)
		RS. P.	RS. P.	
1962–63	Topslip B.C. III	35·93	24·11	
1962–63	Topslip B.C. II	36·90	24·11	
1962–63	Ulandi B.C. II	40·85	24·11	
1963–64	Topslip B.C. II	36·17	24·60	
1963–64	Ulandi B.C. III	44·74	24·60	
1963–64	Palakadavu submergible areas and unworked portion of Ulandi Bamboo coupe.	45·79	21·60	

185. Bamboos occurring in the simple coppice and clearfelling coupes of Pollachi, Udumalpet and Punachi Ranges are allowed to be taken by the respective coupe contractors. No mill supply is marked from these coupes as the quantity of bamboos

obtained is limited. The extraction is only for sale for rural or urban use. The method of exploitation and the classification adopted is the same as in the regular bamboo coupes **with practically similar rates for felling, conversion and transport owing to identical conditions.**

186. *Minor Forest Produce.*—In the Tunacadavu and Punachi Ranges, the collection and marketing of all kinds of minor forest produce excepting canes, deer and sambhur horns, ivory and the valuable remains of dead animals is through the aegis of hill-tribes' co-operative societies constituted in each range. The collection of minor forest produce is made by the hill-tribes resident in these ranges who themselves form members of the society. The collected produce is marketed by the society whose profits are shared by the members, in addition to actual wages paid for collection. In the Pollachi and Udumalpet Ranges, the minor forest produce is sold in auction annually to lessees. The lessees prefer to engage hill labour for minor forest produce collection as they are generally adept in such work.

187. The following are the rates paid for collection of various kinds of minor forest produce in the division :—

Name of produce. (1)	*Selling price.* (2) RS. P	
Honey	30·00	per tin of 25 kilograms.
Wax	2·75	per kilogram.
Tamarind	0·20	Do.
Gallnut	0·18	Do.
Soapnut	0·10	Do.
Cardamom	0·40	Do.
Shekoy	0·30	Do.
Black dammer	0·55	Do.
Pepper	1·00	Do.
Ginger	0·20	Do.
Turmeric	0·20	Do.

188. Deer and sambhur horns, ivory and the valuable remains of dead animals in the forest are collected departmentally as the contractors' may not confine their collections to those lying on the forest floor. These are sent to Satyamangalam Depot in the Coimbatore North Forest Division for sale.

SECTION 5.—PAST AND CURRENT PRICES.

189. *Timber.—Round logs.*—Timber extracted departmentally from the clearfelling coupes in Tunacadavu Range are brought down to Pollachi Timber Depot for sale. Generally, teak and rosewood of A and B classes and some of the better classes of miscellaneous logs are selected and reserved by the Forest Utilisation Officer for supply to the Government of India, the Railways, Madras Government Departments', Industrial Co-operative Societies and quasi-government concerns at rates fixed by the Government. The classification adopted for such supply has been done by the Forest Utilisation Officer, Madras. In the case of miscellaneous species, this classification does not conform to the standard classification adopted in the division (*vide* paragraph 163). In general, logs without defects are treated as A class, while those with minor defects are treated as B class. The classification adopted and the rates fixed for such supply during the period 1958–59 to 1962–63 are given below :—

Statement showing rates fixed by Government for supply of timber to other Government Departments, etc.

Serial number and species.	Specifications.		Rate.	
	Girth.	Length.	A Class.	B Class.
(1)	(2)	(3)	(4)	(5)
			RS. P.	RS. P.
1. *Tectona grandis*	Over 60″ (152 centimetres).	Over 15′ (4·5 metres).	21·00	18·00
Do.	Do	8′ to 15′ (2·4 to 4·5 metres).	20·00	17·00
Do.	48″ to 59″ (122 to 150 centimetres).	Over 15′ (4·5 metres).	19·00	16·00
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	18·00	15·00
Do.	36″ to 47″ (91 to 119 centimetres).	Over 15′ (4·5 metres).	16·00	15·00
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	15·00	14·00
2 *Dalbergia latifolia*	48″ to 59″ (122 to 150 centimetres).	Over 15′ (4·5 metres).	9·00	8·00
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	8·00	7·00
Do.	36″ to 47″ (91 to 119 centimetres).	Over 15′ (4·5 metres).	7·50	6·50
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	7·00	6·00
3. *Terminalia paniculata* and *Terminalia tomentosa*	Over 60″ (152 centimetres).	Over 15′ (4·5 metres).	6·00	5·50
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	5·50	5·00
Do.	48″ to 59″ (122 to 150 centimetres).	Over 15′ (4·5 metres)	4·50	4·00
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	4·00	3·50
Do.	36″ to 47″ (91 to 119 centimetres).	Over 15′ (4·5 metres)	4·00	3·50
Do.	Do	8′ to 15′ (2·4 to 4·5 metres.	3·50	3·00
4 *Lagerstroemia lanceolata*, *Grewia tiliaefolia* and *Albizzia* species.	Over 60″ (152 centimetres).	Over 15′ (4·5 metres)	4·50	4·25
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	4·25	4·00
Do.	48″ to 59″ (122 to 150 centimetres).	Over 15′ (4·5 metres)	4·00	3·75
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	3·75	3·50
Do.	36″ to 47″ (91 to 119 centimetres).	Over 15′ (4·5 metres).	3·75	3·50
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	3·50	3·25

STATEMENT SHOWING RATES FIXED BY GOVERNMENT FOR SUPPLY OF TIMBER TO OTHER GOVERNMENT DEPARTMENTS, ETC.—*cont.*

Serial number and species. (1)	*Specifications.*		*Rate.*	
	Girth. (2)	*Length.* (3)	*A Class.* (4) RS. P.	*B Class.* (5) RS. P.
Pterocarpus marsupium, Artocarpus hirsuta and *Artocarpus heterophyllus.*	Over 60″ (152 centimetres).	Over 15′ (4·5 metres).	7·50	7·00
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	7·00	6·50
Do.	48″ to 59″ (122 to 150 centimetres).	Over 15′ (4·5 metres).	6·50	6·00
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	6·00	5·50
Do.	36″ to 47″ (91 to 119 centimetres).	Over 15′ (4·5 metres).	5·50	5·00
Do.	Do.	8′ to 15′ (2·4 to 4·5 metres).	5·00	4·50

NOTE.—For all timber ex-Pollachi Depot, an amount of Rs. 0·50 per cubic foot is charged in addition to the rates fixed above.

190. **The rest of the timber is sold in open auction to the public at periodical intervals.** The average prices realised **for each class of timber for the various species sold at Pollachi Timber Depot** during the period 1953–54 to 1962–63 are given below :—

STATEMENT SHOWING THE AVERAGE PRICES OBTAINED FOR THE VARIOUS SPECIES OF TIMBERR IN THE GOVERNMENT TIMBER DEPOT AT POLLACHI FROM. 1953–54 TO 1962–63.

Serial number and Species.	*Class.*	1953–54.		1954–55.		1955–56.		1956–57.		1957–58.		1958–59.		1959–60.		1960–61.		1961–62.		1962–63	
(1)	(2)	(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)	
		RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1. *Tectona grandis* (squared)	AL I	14	33	15	62	20	73	20	73	23	54	..		..		..		26	50	..	
	AL II	13	12	13	56	..		..		17	00	..		..		..		..		..	
	AL III	7	33	9	18	11	56	13	00	13	11	10	49	11	77	..		..		..	
	AS I	10	34	17	18	17	30	20	37	17	63	..		13	50	..		..		..	
	AS II	13	12	12	59	17	25	17	25	..		10	30	..		..		..		..	
	AS III	4	75	7	36	10	89	10	60	10	59	12	00	10	70	..		..		..	
	B I	10	77	11	69	17	14	18	33	18	93	16	37	16	00	18	45	26	00	..	
	B II	8	24	9	01	14	43	15	25	15	39	15	52	..		15	14	22	50	..	
	B III	5	04	8	65	12	01	12	21	13	02	13	80	11	94	12	63	17	80	..	
	C I	5	32	8	10	12	58	13	38	15	23	10	66	11	83	12	56	16	35	16	49
	C II	3	02	6	13	10	16	12	13	12	82	8	92	10	25	12	32	15	37	15	10
	C III	2	97	3	58	7	79	9	55	9	52	6	27	8	19	9	37	12	13	7	10
	C IV	3	01	3	03	5	42	7	83	6	42	3	48	5	59	5	97	6	84	7	10
Tectona grandis (round)	AL I	..		..		..		..		..		..		..		..		..		..	
	AL II	..		..		..		..		..		..		..		15	50	..		..	
	AL III	..		..		..		..		..		..		..		12	60	..		..	
	AS I	..		..		..		..		..		..		..		..		..		..	
	AS II	..		..		..		..		..		..		..		..		..		..	
	AS III	..		..		..		..		..		..		..		13	42	..		..	
	B I	..		..		..		..		..		..		..		..		..		..	
	B II	..		..		..		..		..		..		..		..		..		..	
	B III	..		..		..		..		..		..		..		..		..		..	
	C I	..		..		..		..		..		..		..		..		..		14	60
	C II	..		..		..		..		..		..		..		..		..		10	10
	C III	..		..		..		..		..		..		..		..		..		10	20
	C IV	..		..		..		..		..		..		..		..		7	50	7	74
	C VIII	3	83	5	16	7	19	8	02	8	02	6	63	8	16	9	07	10	71	12	10
2. *Dalbergia latifolia* (round)	AL I	13	02	12	51	18	25	20	06	20	06	18	00	15	20	53	69	133	63	202	99
	AL II	8	06	7	69	..		..		11	20	10	30	..		..		27	50	31	10
	AL III	6	19	8	00	..		..		9	30	..		..		..		11	10	..	
	AS I	9	12	17	08	15	31	4	50	45	00	30	00	19	46	110	75	85	62	113	03
	AS II	8	08	7	75	9	00	..		..		8	00	..		..		..		24	00
	AS III	5	69	6	24	..		7	30	7	30	..		..		..		..		..	
	B I	8	32	8	48	12	53	34	74	40	03	54	71	14	36	62	90	61	28	88	44
	B II	5	10	6	49	9	00	13	56	10	70	10	00	10	30	15	60	17	85	18	10
	B III	4	11	5	58	..		8	06	9	00	8	00	9	50	12	50	9	41	13	91
	C I	4	51	7	94	10	16	6	57	6	85	11	69	8	35	13	48	20	40	27	92
	C II	3	22	4	68	6	92	6	99	6	70	5	80	7	02	10	92	10	73	11	18
	C III	2	19	3	73	6	11	6	25	6	25	5	77	6	17	7	73	8	52	9	28

Serial number and Species.	Class.	1953—54.		1954—55.		1955—56.		1956—57.		1957—58.		1958—59.		1959—60.		1960—61.		1961—62.		1962—63.	
(1)	(2)	(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)	
		RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
2. *Dalbergia latifolia* (round)	CIV	1	86	3	10	4	76	4	37	4	37	3	68	4	09	4	62	4	90	5	80
3. *Terminalia paniculata* (squared)	..	2	94	3	87	5	77	4	96	4	90	4	97	5	07	4	79	3	91	4	59
4. *Terminalia tomentosa* (squared)	..	3	10	4	48	5	26	4	95	3	49	4	45	4	26	3	66	4	24	5	78
5. *Grewia tiliaefolia* (squared)	..	2	23	3	26	3	94	3	61	3	52	2	94	2	86	3	19	3	09	3	38
6. *Lagerstroemia lanceolata* (squared)	..	2	46	3	44	3	71	3	72	3	92	4	18	5	86	4	66	4	97	4	13
7. *Albizzia odoratissima* (squared)	..	..		..		..		3	50	3	50	3	90	3	41	2	88	2	83	3	41
8. *Pterocarpus marsupium* (squared)	..	3	98	6	59	5	47	6	00	7	42	4	21	4	02	4	44	4	45	5	98
9. *Hopea parviflora* (round)	..	..		..		..		5	10	5	10	..		6	67	6	86	5	65	6	16
10. *Bischofia javanica* (squared)	..	..		..		..		..		..		..		3	11	2	50	2	15	2	25
11. *Vitex altissima* (squared)	..	..		..		..		..		..		..		..		3	73	3	37	3	91
12. *Radermachera xylocarpa* (squared)	..	1	97	3	41	4	70	4	46	4	87	..		3	58	3	38	2	70	4	25
13. *Artocarpus hirsuta* (squared)	..	..		..		..		..		..		4	61	5	79	6	36	5	68	4	45
14. *Artocarpus hirsuta* (squared)	..	..		..		–		..		..		..		..		4	67	4	20	–	
15. *Chukrassia tabularis* (round)	..	..		..		–		..		..		..		..		..		3	11	3	60
16. *Cedrela toona* (round)	..	..		..		..		2	80	2	80	..		3	06	4	01	3	14	..	
17. *Vateria indica* (round)	..	..		..		..		..		..		..		1	60	2	20	..		..	
18. *Evodia lunu-ankenda* (round)	..	..		..		..		..		..		..		1	10	..		..		..	
19. *Albizzia lebbek* (squared)	..	–		..		..		..		..		..		..		..		..		3	21
20. *Cordia dichotoma* (squared)	..	..		..		..		..		5	27	4	99	5	41	5	01	5	33	6	53
21. *Mitragyna parvifolia* (squared)	..	..		..		..		2	50	2	50	3	11	2	17	2	69	3	25	3	15
22. *Dysoxylum malabaricum* (squared)	..	..		..		..		6	10	6	10	..		4	55	5	29	4	80	3	10
23. *Calophyllum elatum* (round)	..	..		..		..		3	20	3	20	2	30	2	76	3	51	3	23	2	36
24. *Syzygium cumini* (squared)	..	..		..		..		..		3	12	2	70	2	91	2	50	2	44	3	74
25. *Bridelia retusa* (squared)	..	..		..		..		2	85	2	77	2	10	3	26	2	98	3	22	3	44
26. *Adina cordifolia* (squared)	..	2	00	3	53	3	91	6	16	7	37	4	35	4	60	3	96	3	31	3	90
27. *Mesua ferrea* (round)	..	..		..		..		..		..		..		4	10	3	60	2	67	..	
28. *Xylia xylocarpa* (squared)	..	2	18	2	68	4	15	4	05	4	17	3	45	4	40	..		2	30	..	
29. *Mangifera indica* (round)	..	..		..		..		3	31	3	31	2	22	3	20	2	49	2	25	..	
30. *Gmelina arborea* (squared)	..	..		..		..		..		2	10	2	70	2	54	2	70	2	32	2	10
31. *Salmalia malabarica* (round)	..	..		..		..		2	70	2	81	2	79	2	59	..		..		–	
32. *Dillenia pentagyna* (round)	..	..		..		–		..		2	10	1	53	1	10	..		–		–	
33. *Terminalia belerica* (round)	..	..		..		..		..		..		2	17	1	90	–		–		–	

191. Following departmental extraction of timber in the clearfelling coupes of Tunacadavu Range, the softwood trees left standing such as *Salmalia malabarica*, *Evodia lunu-ankenda*, *Machilus macrantha*, *Alstonia scholaris*, *Vateria indica*, etc., and lop and top ends left over are sold separately in auction.

192. The following statements give particulars of the areas sold and the prices obtained during each year such sales were held. Earlier to 1958-59, softwood trees were extracted departmentally and sold at Pollachi Depot. Lop and top ends in clearfelling coupes were not sold earlier to 1959-60.

PRICES OBTAINED BY SALE OF SOFTWOOD TREES IN THE CLEARFELLING COUPES OF TUNACADAVU RANGE.

Year. (1)	*Coupe number.* (2)	*Total number of trees sold.* (3)	*Rate realised per cubic foot of standing volume.* (4) RS. P.
1958–59	Ulandi III	97	1·85
1959–60	Ulandi IV; Additional bit above coupes IV and V	114	2·76
1960–61	Ulandi VI and VII	318	1·64
1961–62	Ulandi VIII and IX	44	2·11
1962–63	Ulandi X and XI	93	2·30
1963–64	Ulandi XII and XIII	296	1·65
	Palakadavu submergible areas, Bits I and II ..	751	2·55
	Palakadavu submergible areas, Bit III	322	1·90
	Chinnar submergible area	207	2·55

PRICES OBTAINED BY SALE OF LOP AND TOP ENDS AND REJECTED TIMBER IN THE CLEARFELLING COUPES OF TUNACADAVU RANGE AFTER DEPARTMENTAL EXTRACTION OF HARDWOOD TIMBER.

Year. (1)	*Coupe number.* (2)	*Area in hectares.* (3)	*Amount fetched.* (4) RS.	*Remarks.* (5)
1959–60	Ulandi IV, additional bit above Coupes IV and V	75·5	24,200	..
1960–61	Ulandi VI and VII	113·5	19,300	..
1961–62	Ulandi VIII and IX	81·5	23,985	..
1962–63	Ulandi X and XI	79·5	34,145	..
1963–64	Ulandi XII and XIII	95·5	22,142	..
	Palakadavu submergible area, Bit I	83·5	10,500	..
	Palakadavu submergible area, Bit II	71·0	31,000	..
	Palakadavu submergible area, Bit III	69·5	10,300	..
	Chinnar submergible area	55·0	12,730	..

194. *Railway Sleepers* :—Wooden sleepers are supplied to the railways from the evergreen forests at rates fixed periodically by the Railway Board. The following statement shows the rates paid by the Railways for sleepers of *Mesua ferrea* and other species supplied from the division between 1954-55 to 1963-64. *Mesua ferrea* sleepers are classed as hardwood, while those of other species are classed as softwood sleepers by the Railways.

Year.	*Sleepers of Mesua ferrea (Hardwoods).*												*Sleepers of other species (softwood).*												Remarks.
	Broad Guage.				*Metre Guage.*				*Narrow Guage.*				*Broad Guage.*				*Metre Guage.*				*Narrow Guage.*				
	I Class.		*II Class.*		*I Class.*		*II Class.*		*I Class.*		*II Class.*		*I Class.*		*II Class.*		*I Class*		*II Class.*		*I Class.*		*II Class.*		
(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)		(13)		(14)
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	BS.	P.	RS.	P.	RS.	P.	RS.	F.	RS.	P.	RS.	P.	
1954—55	20	60	19	50	9	50	9	12	5	75	5	50	17	00	16	50	8	00	7	75	4	87	4	75	..
1955—56	20	00	19	50	9	50	9	12	5	75	5	50	17	00	16	50	8	00	7	75	4	87	4	75	..
1956—57	20	00	19	50	9	50	9	12	5	75	5	50	17	00	16	50	8	00	7	75	4	87	4	75	..
1957—58	20	00	19	50	9	50	9	12	5	75	5	50	17	00	16	50	8	00	7	75	4	87	4	75	..
1958—59	20	00	19	00	9	50	9	00	6	30	6	00	16	00	15	00	7	75	7	25	5	10	4	80	..
1959—60	20	00	19	00	9	50	9	00	6	30	6	00	16	00	15	00	7	75	7	25	5	10	4	80	..
1960—61	20	60	19	60	9	79	9	29	6	49	6	19	16	48	15	48	7	98	7	48	5	25	4	95	..
1961—62	20	60	19	60	9	79	9	29	6	49	6	19	16	48	15	48	7	98	7	48	5	25	4	95	..
1962—63	17	00	16	00	8	50	8	00	5	75	5	45	17	00	16	00	8	50	8	00	5	75	5	45*	..
1963—64	17	00	16	00	8	50	8	00	5	75	5	45	17	00	16	00	8	50	8	00	5	75	5	41*	..

NOTE.—*Same rates were paid for hardwood and softwood sleepers during 1962-63 and 1963-64.

195. **Lop and top ends left over in the sleeper coupes of the Punachi Felling Series are sold in auction for collection of firewood (mainly) and rejected timber in the year following sleeper working. The following statement gives particulars of the areas sold and the revenue realised during each year from 1955–56 to 1961-62. During 1962-63, the lop and top ends were converted departmentally :—**

Year of working. (1)			*Coupes sold.* (2)				*Revenue realised.* (3)	***Remarks.*** (4)
							RS.	
1955–56	..	..	I and II	..	..	..	6,517	..
1956–57	..	..	III (part), IV and V	..	..	..	13,230	..
1957–58	..	..	I, II and III (part)	..	..	..	13,230	..
1958–59	..	.	III (part), IV to VII	..	..	..	39,025	..
1959–60	..	..	I to III (part), VIII and IX		..	..	12,346	..
1959–60	..	..	VIII and IX	..	..	..	34,568	..
1960–61	..	..	III (part), IV to VII	..	..	..	9,521	..
1961–62	..	..	X to XIII	..	..	..	26,250	..
			XIV to XVI	..	..	..	17,010	..
1962–63	..	..	XVII and XVIII (part)	..	..	..	25,050	Worked departmentally.

196. *Teak poles.*—Teak poles are converted into electric transmission posts and supplied to the Electricity Board at rates periodically fixed by the Government. The following statement shows the rates fixed between 1955-56 to-date. Earlier to 1955-56, no supplies were made :—

Classification. (1)	*Rates paid by the Electricity Board.* 1955–56 *to* 1961–62. (2)	 1961–62 *to-date.* (3)
	RS.	RS.
Long posts—8·5 to 9·1 metres in length, with a bottom girth of 75 centimetres and a top girth of 45 centimetres.	30	36
Special length posts—6·7 to 7·3 metres in length with a bottom girth of 65 centimetres, and a top girth of 32·5 centimetres.	20	..
Top pieces—3·0 to 4·3 metres in length, with a bottom girth of 52·5 centimetres, and a top girth of 45 centimetres.	10	11
Bottom pieces—4·3 to 4·9 metres in length, with a bottom girth of 45 of centimetres and a top girth of 32·5 centimetres.	10	13

197. Teak poles not conforming to the specifications of the Electricity Board are extracted for sale to the public. These are sold in auction as and when conversion is complete and the produce is transported to road-side depots. The following statement shows the average annual prices obtained for various categories of poles between 1952—53 to 1962—63 :—

Statement showing the average rates obtained for different classes of teak poles in the Coimbatore South division from 1953–54 to 1962–63.

Year. (1)			*Girth classes in centimetres.* 30—45 (2)	 46—60 (3)	 61—75 (4)	 75—90 (5)	*Remarks.* (6)
1953–54	..	..	0·53	3.44	6·53	18·73	..
1954–55	..	..	0·50	2.09	11·37	17·27	..
1955–56	..	..	..	..	11·66	18·79	..
1956–57	..	..	1·24	3·73	6·75	11·72	..
1957–58	..	..	..	..	..	..	No thinnings were done during this year.
1958–59	..	..	..	..	..	..	Separate rates are not available for each category of poles as the entire quantity was sold in one lot.
1959–60	..	..	..	..	..	..	..
1960–61	..	..	4·07	8.47	17·46	26·13	..
1961–62	..	..	2·14	5·71	10·36	28·33	..
1962–63	..	..	..	..	..	..	No thinnings were done during this year.

198. The prevalent market rates for various categories of poles of teak at some of the important selling centres in the division are given below :—

Classification.	*Selling rates per pole at*		
	Pallachi.	*Coimbatore.*	*Udumalpet.*
(1)	(2)	(3)	(4)
	RS.	RS.	RS.
Poles below 30 centimetres in girth at butt end.	1 to 2	2 to 3	1 to 2·50
Poles above 30 centimetres and below 45 centimetres in girth at butt end.	2 to 4	3 to 5	2 to 4·50
Poles above 45 centimetres and below 60 centimetres in girth at butt end.	2 to 9	5 to 9	3·50 to 9
Poles above 60 centimetres and below 75 centimetres in girth at butt end.	8 to 16	9 to 17	8 to 16
Poles above 75 centimetres and below 90 centimetres in girth at butt end.	15 to 27	17 to 28	15 to 28

199. ***Fuel and small timber.***—The prices realised for timber-cum-fuel coupes in the division from 1954–55 to 1962–63 are exhibited in the subjoined statements.—

PRICES FETCHED FOR FUEL AND SMALL TIMBER COUPES PER ACRE.

Name of felling series.	1954–55.		1955–56.		1956–57.		1957–58.		1958–59.	
	Coupe or compartment number.	*Amount.*	*Coupe or compartment number.*	*Amount.*	*Coupe or compartment number.*	*Amount.*	*Coupe or compartment number.*	*Amount.*	*Coupe or compartment number.*	*Amount.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		RS. P.		RS. P.		RS. P.		RS. P.		RS. P
(*a*) POLLACHI RANGE.										
Pothamadai	II	32 00	I	34 00	IV	111 00	V	220 00	VI	249 00
	..	..	III	65 00	..	..	..	..	..	
	..	..	XXX	32 00	..	..	..	..	..	
Gudaravalli	I	34 00	IV	53 00	V	185 00	VI	260 00	VII	125 00
	II	35 00	..	..	..	..	..	..	..	
	III	36 00	..	..	..	..	..	..	..	
Ayerangal	II	120 00	IV	81 00	V	900 00	VI	701 00	VII	125 00
	III	51 00	..	..	..	..	..	..	..	
Pachathanni	XXII	306 00	XXI	362 00	XXVI	235 00	XXVII	121 00	XXVIII	181 00
	XXIII	186 03	XXIV	330 00	..	..	..	..	..	
Kottur	XXXI	145 00	XXX	50 00	XXXIV	355 00	XXV	206 00	XXXVI	186 00
	XXXII	150 00	XXXIII	93 00	..	..	..	..	..	
Nallar	Not sold.		XXVI	25 25	XXV	22 00	XXIX	31 00	XXX	51 00
					XXVII	24 00	..	..	..	
					XXVIII	13 00	..	..	..	
(*b*) PUNACHI RANGE.										
Punachi	..	..	..	..	..	..	Punachi 6(a) part.	1,461 00	Punachi 6 (a) part.	1,200 00
					—	..	Punachi 6 (b) part.	1,461 00	..	
(*c*) UDAMALPET RANGE.										
Dhali	I	26 00	—	—	—	..	II	650 00	III	200 00
	XI XIII (a)	37 00	—	—	..	..	..	..	..	
Kamanutha	XXXV	56 00	—	—	—	..	XXXVI	140 00	XXXVII	100 00
Chinnar	XX	56 00	—	—	..	..	XXI	121 00	XXII	146 00
Amaravathi — ..	I	18 00	—	—	..	—	Not worked as large portions of this series were submerged in the Amaravathi reservoir.			
Navalodai .. —	I	24 00	—	—	..	—	II	71 00	III	79 00
	XI	20 00	—	..	..	—	..	..	..	..

PRICES FETCHED FOR FUEL AND SMALL TIMBER COUPES PER ACRE—*cont.*

Name of felling series.	1959–60.		1960–61.		1961–62.		1962–63.		1963–64.		*Remarks.*
	Coupe or compartment number.	*Amount.*	*Coupe or compartment number.*	*Amount.*	*Coupe or compartment number.*	*Amount.*	*Coupe or compartment number.*	*Amount.*	*Coupe or compartment number.*	*Amount.*	
	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
		RS. P.		RS. P.		RS. P.		RS. P.		RS. P.	
(*a*) POLLACHI RANGE—*cont.*											
Pothamadai	VII	129 00	X	138 00	XIII	135 00	XIV	100 00	XVI	43 00	Coupe I was felled even before the working plan prescription came into force.
					..		XV	100 00			
	VIII	126 00	XI	51 00	..						
	IX	110 00	XII	33 00	XIV	117 00	XIV	117 25	XV	64 00	
Gudaravalli	VIII	51 00	XI	342 00	..						
	IX	76 00	XII	51 00	..						
	X	201 00	XIII	71 00	XIV	250 00	XV	145 00	XVI	75 00	
Ayerangal	VIII	175 00	XI	101 00					XVII	125 25	
	IX	232 00	XII	70 00							
	X	150 00	XIII	201 00							
	XVIII	153 00									
	XIX	170 00			I	146 00	II	120 00	Not sold.		
Pachathanni	XXIX	66 00	XXX	146 00							
	XX	171 00			XXXIX	371 00	XI	301 00	Not sold.		
Kottur	XXVII	220 00	XXXVIII	300 00							
Nallar	XXXI	37 00	XXXII	39 00	XXXIII	31 00	XXXIV	33 00	Not sold.		
(*b*) PUNACHI RANGE—*cont.*											
Punachi	Punachi 3, 4 [part]	3,360 00	Punachi 3, 4 [part]	1,800 00	Punachi 3, 4 [part]	2,160 00	Punachi 2, 3 [part]	1,600 00	Not sold.		

(c) UDAMALPET RANGE—*cont.*

Dhali	IV	115 00	V	231 00	VI	160 00	VII	107 00	VII	201 00	All the regular fuel coupes of Udamalpet Range were withdrawn from sale during 1955-56 and 1956-57 in view of the sale of the submergible areas of the Amaravathi Reservoir.
	XXXVIII	106 00	XXXIX	155 00	XL	181 00	I	103 25	II	104 00	
Kamanuttu ..	XXIII	105 25	XXIV	140 00	XXV	145 00	XXVI	Not sold	XXVII XXVI	141 00 135 00	
Amaravathi ..	IV	81 00	V	74 00	Not sold	..	VI	51 30	VII VIII	30 00 21 00	
Navalodai ..	..	..	..	..	..	..	..	..			

PRICES FETCHED PER ACRE FOR REMOVAL OF GROWTH (FUEL, SMALL TIMBER, ETC.) FROM THE SUBMERGIBLE AREAS OF THE AMARAVATHI AND ALIYAR RESERVOIRS.

Year. (1)	*Locality.* (2)	*Price fetched per acre.* (3) RS.	 P.
1954–55	Amaravathi submergible areas	20	00
1955–56	Amaravathi submergible areas Bit I	42	00
1955–56	Amaravathi submergible areas Bit II	39	50
1955–56	Amaravathi submergible areas Bit III	28	50
1955–56	Amaravathi submergible areas Bit IV	26	50
1962–63	Aliyar submergible areas Bit I	24	50
1962–63	Aliyar submergible areas Bit II	345	00
1962–63	Aliyar submergible areas Bit III	70	00
1962–63	Aliyar submergible areas Bit IV	125	09
1962–63	Aliyar submergible areas Bit V	265	00
1962–63	Aliyar submergible areas Bit VI	770	00

200. The market rates for fuel and small timber vary according to season and demand. The prevalent rates at some of the important markets in the division are given below :—

(*a*) POLLACHI—

Spokes and felloes (miscellaneous species).—Rs. 75 to Rs. 120 per set.
Plough-shares (miscellaneous species).—Rs. 10 to Rs. 12 each.
Schleichera oleosa fuel (round billets).—Rs. 36 per metric tonne.
Tamarind fuel (round billets).—Rs. 40 per metric tonne.
Anogeissus fuel (round billets).—Rs. 40 per metric tonne.
Miscellaneous fuel (round billets).—Rs. 28 to 35 per metric tonne.
Schleichera oleosa fuel (splitted).—Rs. 39 per metric tonne.
Anogeissus fuel (splitted).—Rs. 51 per metric tonne.
Miscellaneous fuel (splitted).—Rs. 32 to Rs. 40 per metric tonne.
Schleichera and Tamarind charcoal.—Rs. 6-50 per bag of 60 kilograms.
Miscellaneous charcoal.—Rs. 4-50 per bag of 60 kilograms.

(*b*) COIMBATORE—

Spokes and felloes (miscellaneous species).—Rs. 125 to Rs. 140 per set.
Schleichera oleosa fuel (round billets).—Rs. 38 per metric tonne.
Tamarind and *Anogeissus* fuel (round billets).—Rs. 42 to Rs. 47 per metric tonne.
Miscellaneous fuel (round billets).—Rs. 30 to Rs. 37 per metric tonne.
Schleichera oleosa fuel (splitted).—Rs. 40 per metric tonne.
Tamarind and *Anogeissus* fuel (splitted).—Rs. 52 per metric tonne.
Miscellaneous fuel (splitted).—Rs. 32 to Rs. 41 per metric tonne.
Schleichera and Tamarind charcoal.—Rs. 7 per bag of 60 kilograms.
Miscellaneous charcoal.—Rs. 5 per bag of 60 kilograms.

(*c*) UDAMALPET—

Spokes and felloes (miscellaneous species).—Rs. 135 to Rs. 170 per set.
Plough shares (miscellaneous species).—Rs. 12 to Rs. 15 each.
Tamarind and *Anogeissus* fuel (round billets).—Rs. 45 to Rs. 50 per metric tonne.
Miscellaneous fuel (round billets).—Rs. 35 to Rs. 38 per metric tonne.
Tamarind and *Anogeissus* fuel (splitted).—Rs. 55 to Rs. 60 per metric tonne.
Miscellaneous fuel (splitted).—Rs. 45 to Rs. 50 per metric tonne.
Tamarind charcoal.—Rs. 7 to Rs. 9 per bag of 60 kilograms.
Miscellaneous charcoal.—Rs. 6 to Rs. 7 per bag of 60 kilograms.

(*d*) DHARAPURAM—

Spokes and felloes (miscellaneous species).—Rs. 275 to Rs. 300 per set.
Plough shares (miscellaneous species).—Rs. 14 to Rs. 17 each.
Tamarind fuel (splitted).—Rs. 60 to Rs. 65 per metric tonne.
Miscellaneous fuel (splitted).—Rs. 45 to Rs. 50 per metric tonne.
Tamarind charcoal.—Rs. 8 to Rs. 9 per metric tonne.
Miscellaneous charcoal.—Rs. 7 to 8 per metric tonne.

201. Bamboos.—The prices realised for the bamboo coupes of the division between 1954–55 to 1963-64 are given below :—

Name of bamboo series.	1954–55.		1955–56.		1956–57.		1957–58.		1958–59.	
	Coupe number.	Amount.	Coupe number.	Amount.	Coupe number.	Amount.	Coupe number.	Amount.	Coupe number.	Amount.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		(0)
				(a) POLLACHI RANGE.						
		RS.		RS.		RS.		RS.		RS.
Pothamadai ..	I	525	**Not sold.**		III	603	Not sold.		II	236
Ayerangal Upper	I	1,775	II	2,500	III	1,600	I	1,720	II	1 501
Ayerangal Lower	Not sold.	..	II	200	Not sold.	..	Not sold.	..	II	255
Pachathanni	Do.	..	Not sold.	..	Do.	..	Do.	..	Not sold.	
Villoni	Do.	..	II	1,111	Do.	..	II	403	Do.	
Thadaganachi	Do.		Not sold.	..	Do.	..	Not sold.	..	Do.	
				(b) TUNACADAVU RANGE.						
Topslip	II	6,025	III	8,057	I	17,110	II	10,025	III	14,401
Ulandi							I			
				(c) PUNACHI RANGE.						
Punachi	II	900	II	610	Not sold.		I	1,031	Not sold.	
						..	II	311		
							III	222		
				(d) UDUMALPET RANGE.						
Pundi-Vendayam	I	550	Not sold.	—	Not sold.	..	Not sold.	..	Not sold.	
Esalthittu Mangear	Not sold.	..	Do.	..	Do.	..	Do.	..	Do.	
Thalinji	Do.	..	Do.	—	Do.	..	Do.	..	Do.	
Manjampatti	Do.	..	Do.	..	Do.	..	Do.	..	Do.	

The prices realised for the bamboo coupes of the division between 1954-55 to 1963-64—*cont*.

	1959–60.		1960–61.		1961–62.		1962–63.		1963–64.		Remarks.
	Coupe number.	*Amount.*	*Coupe number.*	*Amount.*	*Coupe number.*	*Amount.*	*Coupe number.*	*Amount.*	*Coupe number.*	*Amount*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(*a*) POLLACHI RANGE.											
		RS.		RS.		RS.		RS.		RS.	
Pothamadai	III	1,010	Not sold.	..	Not sold.	..	Not sold.	..	Not sold.	..	Not sold during most of the years for want of demand.
Ayerangal Upper	III	1,901	I	2,700	II	2,310	III	7,100	I	4,265	
Ayerangal Lower	III	401	Not sold.	..	II	560	III	601	Not sold.	..	
Pachathanni	III	482	I	750	II	2,300	III	1,100	I	1,585	Do.
Villoni	III	336	I	1,700	II	1,905	Not sold.	..	Not sold.	..	Do.
Thadaganachi	Not sold.	..	Not sold.	..	II	1,900	Not sold	..	Not sold.	Do.	Do.
(*b*) TUNACADAVU RANGE.											
Topslip	I	36,300	II	24,100	..	..	I III (part)	68,100 13,140	II	36,500	A portion of Topslip B.C. III was worked departmentally during 1961–62. The unworked portion of the coupe was sold in auction during 1962–63.
Ulandi	II	25,100	III	29,700	I	37,000	II	5,400	Palakadavu submergible area and II (part). III	10,000 15,111	The Ulandi Series was constituted only in 1958.
(*c*) PUNACHI RANGE.											
Punachi	I	1,355	II	3,400	II	3,400	III	535	Not sold.		Most of the years, the coupes were not sold for want of demand. Coupes I, II and III were worked during 1957–58 due to flowering.
(*d*) UDUMALPET RANGE.											
Pandi-Vendayam	Not sold.	..	I	400	II	920	Not sold.	..	Not sold.	..	Most of the years, the coupes were not sold for want of demand.
Esalthittu Mangear	Do.	..	Not sold.	..	Not sold.	..	Not sold.	..	Do.	..	
Thalinji	Do.	..	Do.	..	Do.	..	Do.	..	Do.	..	
Manjampatti	Do.	..	Do.	..	Do.	..	Do.	..	Do.	..	

202. As mentioned earlier in this chapter, since 1962—63, 75 per cent of the bamboo output from the coupes in Tunacadavu Range are earmarked for supply to the Seshasayee Papers and Boards Limited, Pallipalayam.

The following rates were paid by the firm during 1962-63 and 1963—64 as royalty to the department :—

Year. (1)	*Name of coupe.* (2)	*Royalty paid for each metric tonne of air-dried bamboos.* (3)
		RS. P.
1962–63	Topslip Bamboo Coupe I	7·39
	Topslip Bamboo Coupe III	7·39
	Ulandi Bamboo Coupe II	7·39
1963–64	Topslip Bamboo Coupe II	6·90
1963-64	Ulandi Bamboo Coupe III	6·90
1963–64	Palakadavu submergible areas and portions of Ulandi Bamboo Coupe II	6·90

203. The prevalent rates for retail sale for various categories of bamboos at Pollachi, Coimbatore, Udumalpet and Dharapuram which constitute the chief markets for the division are given below :—

Local name.	Species.	Description of size.	Measurements.		Selling rates.
			Girth in centimetres.	Length in metres.	
(1)	(2)	(3)	(4)	(5)	(6)
		(*a*) POLLACHI.			
1. *Valai*	*Bambusa arundinacea*	Bottom piece	35 to 50	4 6 to 5·5	Rs. 1·25 to Rs. 2·00 per bamboo.
2. *Mathuraipootu*	*Do.*	Do.	20 to 25	3·0 to 3·5	Rs. 0·60 to Rs. 1·25 per bamboo.
3. *Vettukai*	*Do.*	Do.	12·5 to 20	3·0 to 3·4	Rs. 0·45 to Rs. 0·50 per bamboo.
4. *Kadaipoottu*	*Do.*	Do.	15 to 18	3·0 to 3·4	Rs. 0·20 to Rs 0 23 per bamboo.
5. *Odai*	*Do.*	Top piece	25 to 36	3·7 to 5·5	Rs. 1·25 per bamboo.
6. *Kanniodai*	*Do.*	Do.	20 to 25	3 7 to 5·5	Rs. 0·60 per bamboo.
7. *Valkol*	*Do.*	Do.	15 to 18	3·0 to 3·4	Rs. 0·23 per bamboo.
8. *Pachi*	*Dendrocalamus strictus*	Bottom piece	7·5 to 12·5	3·7 to 4·6	Rs. 0·15 per bamboo.
9. *Vedarkol*	*Do.*	Do.	15 to 18	3.0 to 3·4	Rs. 0·22 per bamboo.
10. *Dabbai* (splits)	Both species	....	..	2·4 to 3·1	Rs. 1·25 per bundle of 25 numbers.
		(*b*) COIMBATORE.			
1. *Mathuraipoottu*	*Bambusa arundinacea*	Bottom piece	20 to 25	3·0 to 3·5	Rs. 1·25 to Rs. 2·25 per bamboo.
2. *Vettukai*	*Do.*	Do.	12·5 to 20	3·0 to 3.4	Rs. 0·50 to Rs. 0·60 per bamboo.
3. *Odai*	*Do.*	Top piece	25 to 36	3·7 to 5·5	Rs. 1·30 to Rs. 1·40 per bamboo.
4. *Kanniodai*	*Do.*	Do.	20 to 25	3·7 to 5·5	Rs. 0·70 to Rs. 0·85 per bamboo.
5. *Pachi*	*Dendrocalamus strictus*	Bottom piece	5·5 to 12·5	3·7 to 4·6	Rs. 0·20 to Rs. 0·25 per bamboo
6. *Dabbai* (splits)	Both species	....	..	2·4 to 5·1	Rs. 1 50 per bundle of 25 numbers.
		(*c*) UDUMALPET.			
1. *Mathuraipoottu*	*Bambusa arundinacea*	Bottom piece	20 to 25	3·0 to 3·5	Rs. 0 60 to Rs. 1·25 per bamboo.
2. *Vettukai*	*Do.*	Do.	12·5 to 20	3·0 to 3·4	Rs. 0·50 to Rs. 0·55 per bamboo.
3. *Odai*	*Da.*	Top piece	25 to 36	3·7 to 5·5	Rs. 0·90 to Rs. 1·20 per bamboo.
4. *Kanniodai*	*Do.*	Do.	20 to 25	3 7 to 5·5	Rs. 0·68 per bamboo.
5. *Pachi*	*Dendrocalamus strictus*	Bottom piece	7·5 to 12·5	3·7 to 4·6	Rs. 0·48 per bamboo.
6. *Dabbai* (splits)	Both species	....	..	2·4 to 3·1	Rs. 1·50 per bundle of 25 numbers.
		(*d*) DHARAPURAM.			
1. *Mathuraipoottu*	*Bambusa arundinacea*	Bottom piece	20 to 25	3·0 to 3·5	Rs. 0·80 to Rs. 1·40 per bamboo.
2. *Vettukai*	*Do.*	Do.	12·5 to 20	3·0 to 3·4	Rs. 0·60 to Rs. 0·80 per bamboo.
3. *Odai*	*Do.*	Top piece	25 to 36	3 7 to 5·5	Rs. 1·00 to Rs. 1·40 per bamboo.
4. *Kanniodai*	*Do.*	Do.	20 to 25	3·7 to 5.5	Rs. 0·[illegible]5 to Rs. 0·93 per bamboo.
5. *Pachi*	*Dendrocalamus strictus*	Bottom piece	7·5 to 12·5	3 7 to 4.6	Rs. 0·55 to Rs. 0·60 per bamboo.
3. *Dabbai* (splits)	Both species	....	....	2·4 to 3·1	Rs. 1·75 per bundle of 25 numbers.

204. *Minor Forest Produce*—The prices obtained for minor forest produce during the period 1954–55 to 1963–1964 are given below.—

Name of unit. (1)	1954–55 (2)	1955–56 (3)	1956–57 (4)	1957–58 (5)	1958–59 (6)	1959–60 (7)	1960–61 (8)	1961–62 (9)	1962–63 (10)	1963–64 (11)	*Remarks.* (12)
					(a) POLLACHI RANGE						
	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	
Gall nuts	235·00	265·00	400·00	495·00	350-00	300·00	390·00	Not sold	..	..	Gallnuts were collected departmentally during 1962–63 and 1963–64.
Avaram bark	Not sold	Not sold	75·00	267·50	195·00	210·00	251·00	175·00	Not sold	Not sold	
Rela bark	Not sold	Not sold	Not sold	245·00	Not sold	Not sold	Not sold	Not sold	Not sold	Not sold	
Lemon grass	4,281·00	2,200·00	2,625·00	1,310·00	Not sold	1,100·00	1,285·00	3,125·00	6,700·00	Not sold	
Canes	Not sold	Not sold	Not sold	Not sold	Not sold	171·00	Not sold	Not sold	Not sold	Not sold	
All other items.	8,775·00	2,500·00	4,850·00	4,100·00	3,750·00	5,050·00	13,112·00	19,000·00	20,000·00	17,500·00	
					(b) TUNACADAVU RANGE.						
All items	2,840·00	2,100·00	3,290·00	3,368·00	2,245·00	2,396.00	3,412·00	4,041·00	4,940·00	4,200·00	Leased to Tunacadavu Hill Tribes Co-operative Society.
					(c) PUNACHI RANGE.						
Gall nuts	Not sold	400·00	514·00	435·00	435·00	446·00	760·00	360·00	..	..	Collected departmentally during 1962–63 and 1963–64.
Rela bark	Not sold	360·00	Not sold	Not sold	200·00	Not sold	Not sold	Not sold	Not sold	Not sold	
Lemon grass	1,751·00	1,501·00	3,325·00	1,630·00	700·00	2,500·00	1,565·00	2,995·00	9,000·00	2,001·00	
Reeds	1,515·00	1,501·00	1,445·00	1,553·00	1,514.00	1,506·00	2,510·00	2,671·00	3,236·00	2,900·00	
Cardamom	1,000·00	2,500·00	1,492·00	1,492·00	1,492·00	5,000·00	3,000·00	3,126·00	..	..	Collected departmentally during 1963–64.
Canes	Not sold	Not sold	Not sold	Not sold	Not sold	Not sold	Not sold	Not sold	Not sold	600·00	Collected departmentally during 1962–63 and 1963–64.
All other items.	Not sold	1,701·00	1,342·00	2,203·00	2,203·00	2,377·00	2,080·00	2,201·00	2,220·00	2,220·00	Leased to Punachi Hill Tribes Co-operative Society with effect from 1956–57.

Number of unit. (1)	1954–55 (2)	1955–56 (3)	1956–57 (4)	1957–58 (5)	1958–59 (6)	1959–60 (7)	1960–61 (8)	1961–62 (9)	1962–63 (10)	1963–64 (11)	*Remarks.* (12)
(d) UDUMALPET RANGE.											
Gall nuts ..	1,500·00	1,501·00	1,801·00	3,001·00	1,751·00	2,420·00	2,400.00	455·00	..	..	Collected departmentally during 1962–63 and 1963–64.
Avaram bark .. (Dharapuram taluk).	200.00	Not sold	Not sold	1,300·00	699·00	50·00	265·00	210·00	Not sold	Not sold	
Avaram bark .. (Udumalpet taluk).	Not sold	Not sold	50.00	75·00	150·00	152·00	315·00	Not sold	Not sold	Not sold	
Rela bark ..	Not sold	Not sold	200·00	Not sold	Not sold	351·00	Not sold	Not sold	Not sold	Not sold	
Euphorbia ..	500·00	Not sold	281·00	Not sold	Not sold	125·00	135·00	Not sold	Not sold	Not sold	
Lemon grass ..	2,111·00	1,251·00	1,261.00	1,286·00	Not sold	500·00	775·00	1,010·00	4,210·00	Not sold	
Canes ..	Not sold	Not sold	Not sold	Not sold	Not sold	Not sold	Not sold	Not sold	Not sold	2,001·00	
All other items.	1,350.00	1,320·00	1,750·00	2,501·00	1,001·00	2,403·00	2,050.00	2,650·00	2,400·00	4,000·00	

205. The bazaar sale rates for different kinds of minor forest produce are given below :—

Name of produce. (1)	*Selling price.* (2) Rs. P.	
Honey	60·00	per tin of 25 kilograms.
Wax	5·50	per kilogram.
Shekoy	1·50	Do.
Cardamom	22·00	Do.
Dammer	1·60	Do.
Canes	70·00	Do.
Tamarind	1·00	Do.
Gallnuts	20·00	per bag of 100 kilograms.

CHAPTER IV—STAFF AND LABOUR SUPPLY.

SECTION 1—STAFF.

208. Staff—The existing establishment of the division is detailed in the following statements.

A. HEADQUARTERS STAFF.

Description of staff. (1)	*Name of post.* (2)	*Sanctioned strength.* (3)	*Remarks.* (4)
Administration	District Forest Officer.	2	
	Assistant Conservator of Forests.	1 (temporary)	Sanctioned for the departmental exploitation of timber from the areas submergible in the Ulandi and Palakadavu Blocks when the Parambikulam reservoir is constructed.
Ministerial	Head clerk.	1	
	Accountants.	2	
	Upper Division Clerks.	2 (temporary)	One post sanctioned for the Farm Forestry scheme and the other post for the departmental exploitation of timber from the Palakadavu submergible areas.
	Lower Division Clerks.	6 (1 temporary)	
	Draughtsman.	1	
	Tracer.	1 (temporary)	Sanctioned for the Palakadavu Scheme but the post is kept vacant for want of suitable hands.
	Typist.	1	
	Tally Clerk.	2 (temporary)	
Menials	Peons.	5 (1 temporary)	The temporary peon is under the Assistant Conservator of Forests, Palakadavu Scheme.
Miscellaneous	Office Watcher.	1 (temporary)	
	Jeep Driver.	1 (temporary)	

B. RANGE ESTABLISHMENT.

Description of staff.	*Name of post.*	*Pollachi Range.*	*Tunacadavu Range.*	*Punachi Range.*	*Udumalpet Range.*	*Pollachi Timber Depot.*	*Special Aliyar duty.*	*Forestry Farm Range, Kangayam.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Executive	Range Officers.	1	1	1	1	1	1 (temporary).	1 (temporary).	
	Assistant Range Officers.	..	2 (temporary).	..	..	..	..	..	The temporary Assistant Range Officers in Tunacadavu Range are sanctioned for the Palakadavu scheme.
Protective	Foresters.	2 (1 temporary).	17 (10 temporary).	6 (5 temporary).	2	1	1 (temporary).	2 (both temporary).	
	Forest Guards.	12 (4 temporary).	11 (5 temporary).	12 (8 temporary).	11 (1 temporary).	..	2 (both temporary).	2 (both temporary).	
	Reserve Watchers.	8	..	3	10	..	..	..	
Ministerial	Range Clerks.	1	2 (1 temporary).	1	1	1	..	..	
	Tally clerks.	..	1	..	..	..	..	..	
Menials	Range Peons.	1	3 (2 temporary).	1	1	..	..	1 (temporary).	
	Bungalow Watchers.	1	..	..	..	..	..	..	
	Depot Watchers.	..	10 (All temporary).	..	..	2 (both temporary).	..	..	
	Gate Watchers.	1	..	..	..	..	..	..	

C. OTHER ESTABLISHMENT.

Description of staff. (1)	*Name of post.* (2)	*Sanctioned strength.* (3)	*Remarks.* (4)
Medical	Junior Assistant Surgeon for Topslip Dispensary.	1	All the medical staff are temporary.
	Pharmacist for Topslip Dispensary ..	1	
	Male Nursing Orderly	1	
	Maternity Assistant	1	
	Man of all works	1	
Miscellaneous	Road Roller Driver	1	
	Teacher for Aboriginal Tribes' School at Anaigundi.	1	
	Cook for Aboriginal Tribes' School at Anaigundi.	1	
	Mahouts	13	
	Cavadies	10	

207. ***Sections and Beats.***—Among the four territorial range charges constituting the division (*vide* paragraph 30 under Chapter I), the Tunacadavu Range is not divided into sections and beats for purposes of protection. Protection is seldom a problem here on account of the distance of the forests from the villages in the plains. Foresters and Forest Guards of the ranges are usually employed for carrying out sanctioned works assigned to them either individually or in groups of two or more depending on the magnitude of each work. The other three territorial ranges are divided into sections and beats as detailed below :—

Name of range. (1)	*Sections.* (2)	*Beats.* (3)
Pollachi. H. Q : Anamalai Farm.	**Sethumadai.** H. Q : Sethumadai.	Pothamadai. H. Q.: Sethumadai. Gudaravalli. H. Q : Sethumadai. **Ayerangal. H. Q.: Sethumadai.** **Pachathanni. H. Q.: Sethumadai.**
	Kottur. H. Q : Angalakurichis ..	Ardanaripalayam. H.Q.: Ardanaripalayam. Villoni. H. Q.: Angalakurichi. Mankarai. H. Q.: Malayandipattinam.
Punachi. H. Q : Waterfall ..	Attakatti. H. Q :Attakatti ..	Paruthivur. H. Q.: Paruthiyur. Attakatti. H. Q.: Attakatti. Iyerpadi. H. Q.: Iyerpadi.
	Valparai. H. Q : Cinchona ..	Akkamalai. H. Q.: Akkamalai. Kallar. H. Q.: Cinchona First Division.
Udumalpet. H. Q : Udumalpet.	Dhali. H. Q : Easalmanthorai ..	Karattur. H. Q : Karattur. Vallakondapuram. H. Q.: Karattur. Kurumalai. H. Q.: Easalmanthorai. Easalthittu. East H. Q.: Manupatti. Easalthittu. West H. Q.: Easalmanthorai.
	Manupatti. H. Q : Manupatti ..	Kombu West. H. Q.: Manupatti. Kombu East. H. Q.: Manupatti. Kallapuram. H. Q.: Kallapuram. Thalinji. H. Q: Thalinji. Manjampatti. H.Q.: Manjampatti Uthiyur. H. Q.: Uthiyur for the Forest Guard and Dalavoipattinam for the Reserve Watcher. **Garudankottai. H. Q.: Garudankottai.**

208. The distribution of sections and beats of the respective Foresters and Forest Guards are shown on the management maps. In addition to Foresters and Forest Guards in direct charge of a section or beat, each range may have one or more Foresters or Forest Guards to attend to special items of work.

209. The non-territorial range charges consisting of the Pollachi Timber Depot, Aliyar special duty and the Farm Forestry Range have a Range Officer in charge of each range with one or more Foresters or Forest Guards for assistance. As these ranges have no territorial authority, their division into sections and beats does not arise.

SECTION 2—LABOUR SUPPLY.

210. In the greater part of the division, the bulk of the labour is drawn from the hill tribes living inside the forests. While this is true in respect of the hills, in the Dharapuram taluk which is devoid of hill-tribes or forests worth the name, labour from the villages has to be necessarily employed for regeneration works in the ex-panchayat and farm forestry areas. In the hills, the jungle tribes are employed only for certain occupations such as regeneration, fire-line and coupe-line clearings, cultural operations, elephant care and maintenance, minor forest produce collection, etc., even for which their existing strength is not sufficient to carry out all the works. This is particularly so in respect of the Tunacadavu Range where the labour position has always been difficult. The situation has worsened further with the secession of the Thekkadi leased forests to the new Kerala State consequent to 'States Reorganisation'. A good number of hill-tribes had to be left behind, although the quantum of regeneration and other works in the range has continued to be almost the same on account of the opening up of the Ulandi Valley. With the advent of the Parambikulam-Aliyar Project in 1958, the labour position has worsened all over the division as large numbers of hill tribes are attracted to project works on account of more attractive wages for comparitively less arduous work. In the Punachi Range, the Anamalai Estates still continue to be a serious competitor to the Forest Department in the recruitment of hill-labour. All these factors have often necessitated in the import of labour from the plains to supplement the existing labour force for even unskilled works. In the Udumalpet Range, however, where the Pulayars form the principal hill-tribe community, plains labour is normally preferred to irrespective of the availability of hill labour or otherwise, as the Pulayars are lazy and ordinarily poor workmen.

211. For skilled works such as felling, conversion, and dragging and sawing of timber, labour is principally drawn from the villages of Mundur, Mannarghat and Nemmara in Kerala and to a certain extent from the Malasar tribe. The Malabar mazdoors mostly belong to the *Moplah* community. They are generally adept in their work as logging has been their traditional profession for many generations. The same is the case with carpenters who are also drawn from Kerala. For road and building works, *Odders* or *Boyans* from Satyamangalam and Gobichettipalayam Taluks are recruited. They constitute a professional class of skilled mazdoors adept in masonry work. Other classes of skilled workers like mechanics, tinkers, welders, plumbers and painters have to be recruited only from the plains.

212 *Hill-tribes*.—There are in the Anamalais six different hill-tribes, namely, the Kadars, Malasars, Maloi Malasars, Pulayars, Muduvars and the Eravalars. Of these, the Eravalars constitute but a small minority generally restricted to the foot hills. The other five hill-tribes are in contrast spread out in different settlements distributed over one or more ranges of the division, in private lands adjacent to the forests and also in the adjoining forests of Kerala State. Each settlement or *pathy* as it is referred to, consists of a group of ten or more huts, huddled together on the banks of a stream or on an open glade within the forest. The huts are generally built of bamboo; the walls and roof are thatched with grass or reed leaves. Anthropologists consider that apart from the Kadar who has

certain Australoid features, the rest of the hill-tribes in the Anamalais are for racial purposes indistinguishable from the plainsmen in the adjoining regions. The present differences in social customs and manners between the plainsmen and the tribes are believed to be the result of long isolation in the hills modified by changes accrued in each community during the space of time.

213. *Kadars.*—The Kadars are the most primitive of the hill-tribes in the Anamalais. They are short in stature, dark-skinned with flat noses, and slightly thicker lips than those of the other hill-tribes. A small percentage of Kadars exhibit frizzly hair, a characteristic which has led some anthropologists to affiliate them with the aboriginal tribes of Australia.

214. The Kadars are nomadic in nature and keep constantly shifting from the Anamalais to the adjoining Kerala State. The villages are seldom permanent. Fire is kept continuously burning day and night in every Kadar hut presumably for protection or warmth, or both. Each Kadar settlement has a headman or *mooppan* who is the chief of the settlement in matters of all disputes and is their spokesman to officers of the Government. The *Muppatti* (wife of the *mooppan*) heads the Kadar women.

215. The Kadars live by hunting and collecting forest produce. They eat mostly succulent roots and vermin; also bamboo seeds, sheep, fowls, pythons, deer, porcupines, field rats, monkeys, etc. The mealy portion of the seeds of *Cycas* are in particular relished by them. Sago palm (*Caryota urens*) is another favourite diet for them. They take opium in large quantities. While Kadar men smoke tobacco, the women enjoy chewing it. Men as well as women used to consume arrack and toddy plentifully in pre-prohibition days.

216. The Kadar woman wears her hair in a fringe and has the habit of distending a hole in the lobe of the ear with a circular roll of bamboo or palm leaf roll. The woman also wears on her hair a comb. The Kadars have a curious habit of chipping the incissor teeth to the shape of a cone as they reach adolescence. It is said to be a painful operation, but gone through by every boy and girl with an eye to aesthetics. "In these characteristics, the Kadar is unlike any other hill-tribe in India and is distinctly an alien". (A. Ayyappan, 1940).

217. The Kadars speak Tamil of a poor type which has an admixture of Malayalam. They are fond of music and singing. They dance too. They add the suffix Ali to their names, viz., Mudi Ali, Kathi Ali, Poo Ali, etc.

218. Their marriage customs are similar to those of the Malasars. Adults only marry and by mutual consent. Another way of marrying is for a young man to go out of his village for a whole year, select a girl and return for the consent of his elders. The Kadar has to present a comb made by himself to his bride, a custom similar to that of the Semangs of Indonesia. Once the marriage is over, the woman is no more free. The woman becomes subservient to the husband and every slip from rules of married life is punished. As a rule, Kadar girls are modest and child-like and make good wives, but instances of disobedience or infidelity are not unknown when they are punished by expulsion from the hills to live among 'the low castemen' of the plains for the future. Polygamy is indulged in by the Kadar with a view to increase his tribe. Polyandry is unknown. Widows cannot remarry, but may stay in concubinage.

219. The family ties of the Kadar are well developed. The sons even after marriage live with their wives along with their parents contributing their share of maintenance or live separately in their own huts. The son succeeds to the property of the father, but in the case of *mooppans*, the eldest nephew succeeds. On assuming the title, he is given a stick with a silver head.

220. The Kadars worship dead ancestors in times of illness and before auspicious undertakings. They consider themselves to be superior to the Malasars. There is mutual pollution by touch between Kadars and Malasars. They have little inter-course with each other. The Kadars consider the gaur unclean and will not even touch its

body; the same way, also the elephant's dung. Wild elephants are venerated but tame ones are believed to have lost the divine element in them. They therefore do not come forward to serve as elephant attendants. Short-tailed black moneys are considered a curse to the forests and hunted.

221. The primary occupation of the Kadar is collection of forest produce. They are excellent trackers and serve as useful guides. They are also expert tree climbers. Even lofty trees over 30 metres in height with long clear boles and few branches present little

branchless portions of the stem to serve as steps and the desired portion of the tree is reached. Sometimes they use long lengths of *Bambusa arundinacea* to serve as a ladder in helping to climb tall trees. The side branches of the bamboo are trimmed leaving a butt of 10 to 15 centimetres at each node to serve as steps of a ladder. The bamboo is placed leaning on a tree, and one of them holds it firmly as the other climbs up. Very often this method is combined with the method of using pegs driven into the stem in climbing exceptionally tall trees. They also climb over precipitous rocks in pursuit of the rock bee-hive. They use a chain of loops made of rattan to help them descend such precipitous rocks. These habits of the Kadars have been profitably utilised in collecting minor forest produce, particularly honey. They form the back bone of the labour force for collection of minor forest produce. They have little knowledge of cultivation and object to working with a *mammutti*, but armed with a keen edged bill-hook they are immensely efficient. They constitute the chief labour force for weeding and other cultural works in the Tunacadavu Range. Even collection of bamboos and reeds are entrusted to them.

222. *Malasars.*—The Malasars are also known as 'Malayar' or 'Malai Arasar'. Their settlements extend along the outer slopes of the hills sometimes right up to the foot-hills. They are in close contact with plainsmen, often living close to them and providing them with domestic and agricultural labour. Each *pathy* is named afte the owner of the land, e.g., *Sarkarpathy*, *Karuppa Goundan pathy*, *etc.*

223. The Malasars are comparatively sturdier in build when compared to other hill-tribes in the Anamalais and do not have the characteristic features of regular hill-men. By their origin they are divided into two groups, viz. (1) The Nattu Malasars and (2) the Kongu Malasars, although they live side by side. The Nattu Malasars believe that they are 'Nayars' living on the hills and attribute their present degradation to their women having fallen in the past and induldged inter-course with 'low caste' men of the plains. The Nattu Malasars also claim from Shiva and Parvathi who came down as hunters to grant the *Pasupatha* to Arjuna. Sometimes allusion is also made to Surpanaka of the Ramayana. In appearance, the Nattu Malasars are dark brown in colour and short in stature. Their face becomes pointed towards the chin. They part their hair in the middle and knot it at the back. The Kongu Malasars claim to have come from Kongumandalam. They are dark in colour and show a tendency to a flat nose and thick lips. This is attributed to admixture with Kadars. Their women wear brass and palm-leaf rolls in their ears, brass bead necklace and *metti* on their second toe. Like other hill-tribes, each Malasar settlement has its *mooppan* or headman. The *mooppan* prescribes the work to be done in the land-lord's fields, hears complaints and presides at marriage festivals. He has to look after the welfare of the community. Each settlement has also a *pujari* who is inspired into delphic oracles while naming every infant born in the settlement.

224. The Malasars speak a patois of Tamil. Greater part of their food is a wild yam. They secure rice by selling or exchanging their collections. They dam up the streams in hot weather to catch fish, or sometimes add vegetable poisoning material to kill them. *Samai (Pamcum miliare)*, *Tenai (Setaria italica) and Cambu (Pensetum typhoides)* are used as gruel. The eat carcasses left over by tigers. Unlike the Kadars, they eat the flesh of gaur. They also eat deer and tahr, but abstain from the flesh of the cow, dog, tiger and elephant. The greatest delicacy with which they welcome high caste folk is the bamboo seed boiled in honey inside a hollow bamboo plastered with mud and placed on fire. The bamboo splits and out comes a cylindrical mass of sweet stuff.

225. The Malasars marry off their girls before puberty. The parents chose the husband. The betrothal is signified by the tying of an yellow thread round the bride's neck by the prospective mother-in-law. The Kongu Malasars are slightly different from the Nattu Malasars in that the married couple live in a separate hut on their own labour, a custom common amongst the Goundens of Kongu Nadu. The Nattu Malasars follow the *marumakkatayam* law of inheritance unlike the Kongu Malasars who adopt the *makkatayam* system. Other features of married life are almost similar to both the groups. In cases of misconduct by a wife, the village assembly meets and on finding the women guilty sentences her to flogging after which she is sent off to her parents. The husband will not take her back but another man may marry her. Widow re-marriage is allowed but the widow must marry outside the clan and the village of her deceased husband. Polygamy is allowed among the Malasars, but not polyandry.

226. The Malasars live essentially by working as forest or agricultural labourers. They are experts in catching and taming elephants. Most of the *mahouts* and *kavadies* employed by the department are malasars. They are excellent trackers and clever in trapping hare and deer. They are also good axemen and baggage coolies. They carry loads on their heads unlike the Kadar or the Pulaya who will strap their luggage on to their backs. As coolies they are however not quite dependable as they desert *en masse* on the slightest excuse. They are also addicted to stealing and burglary whenever there is a chance.

227. *Malai Malasars*.—The Malai Malasars are essentially Malasars. They are no different from rest of the Malasars, the term Malasar being used to denote those living on the slopes and near the foot-hills, while those living right on the hills are called Malai Malasars. They are a small group confined to the Ulandi Valley and have the same manners and social customs of the Malasars, except that they do not eat any of the domestic animals. They don't drink even milk. Even touching cow-dung is said to be a taboo for them. There is at present only one settlement of Malai Malasars at Varagaliar.

228. *Pulayars*.—The Pulayars have been aptly described as the Pulayan of the wild looks. They are a malodorous and unsightly race. They are generally dressed in dirty rags. The hair is of enormous length. The Pulayan would not cut it but arrange it into six or eight plaited coils gathered into one single lock at the back of the head. Some members of the tribes would wear their hair in large bunches at the sides bound round the forehead with a small brass chain. Some however take no pride whatsoever in their hair and leave them standing in a dishevelled fashion like savages.

229. The Pulayars prefer to live in the warmer tracts of the division and are mostly confined to the Udumalpet Range although one settlement exists in the Punachi Range also. They have their own villages which are moved once every few years to follow shifting cultivation or abandoned in haste due to epidemics of small-pox or yaws. They are so lazy and untidy that periodic epidemics of small-pox are a regular feature and several prosperous settlements have been wiped off in the past. Each settlement has a *mooppan* or headman just as in the other tribes, who is their undisputed chief for all disputes. Some of the Pulaya settlements have in addition a *Sarkar Mooppan*, who is considered to be their official spokesman to the Government or in any dealings with the public, while the other headman or *Ooru Mooppan* as he is called is the domestic head of the village.

230. The Pulayars eat practically everything including gaur, cows, lizards and monitors, both living or dead. Rats are their favourite food. They have indigenous traps made with bamboo and string for catching rats, birds, wild bear and porupine. Although they take up to cultivation unlike the Kadars or the Malasars, they are so lazy by habit that the yields are very poor. Precarious methods of cultivation with low yields have probably induced them to take up to shifting cultivation in the past. In an effort to compromise their age-old habits, each settlement is allotted with large areas in excess to their requirements so that they could adopt shifting cultivation within the

area thus allotted, thereby minimising the damage to the forest. More than 75 per cent of the lands thus set apart are now swamped with weeds and *Lantana* due to the ravages of shifting cultivation. When food is available they will divide it equally and eat, but in lean periods they virtually live on starvation. They will shirk work at the earliest opportunity and prefer to beg food or lick garbage around temples in the foot-hills of the forests. Although several settlements exist in the Udumalpet Range, they are not useful as forest labour on account of their inherent lazy habits and Range Officers prefer to import labour from the plains rather than engage them. The Pulayas however have their good points also. They are fairly good in collection of minor forest produce such as gall-nuts, honey, wax, etc. They also make good baggage coolies. They are also good in looking after cattle and each Pulaya settlement undertakes to have a pen by its side. In return for this, the Pulayars are fed by the land-lords of the plains who virtually treat them as their slaves.

231. *Muduvars.*—The Muduvars or Mudugars are a tribe of hill cultivators orginally said to belong to Madurai district. According to a legend, owing to a war in which the Pandyan King of Madurai was involved, some of them fled to the Nilgiris leaving the pregnant women behind. The bulk of the tribes went to live in the Anamalais and the Travancore High Ranges carrying their children on their backs. Hence the name 'Mudugar'. There is supposed to be enmity between these vague Nilgiris people (?) and the Muduvar even to-day. Outsiders call the Muduvars as Tagappanmargal meaning fathers—a title used by low castes to masters.

232. Each settlement has a panchayat of elders, the oldest of them being the head. Sometimes there may be no panchayat, and a settlement may have a headman or *mooppan* as in the other hill-tribes. There is also a *Mel-vakkan.* These two offices are hereditary. The Muduvars follow *marumakkatayam* or the matriarchal system of inheritance.

233 The Muduvars are distinctly of plain country origin as may be judged from their colour and regular features. They rank high among the hill tribes and shun all the other tribes for fear of pollution. They consider that no one is good enougth to eat, drink or smoke with them. Outsiders are not normally admitted into their caste although Vellalas may be occasionally permitted. In such cases, they insist on a period of probation. The Muduvars have a dialect of their own, which is a poor form of Tamil mixed with a few Malayalam words.

234. The Muduvars are essentially cultivators. In this respect they are decidedly better than the other hill tribes, as they are comparatively more hard working and better yields are invariably obtained. They too are nomadic and indulge in shifting cultivation. Although definite areas have been allotted to them, they have often abandoned their settlements encroaching into adjacent territory. Hill paddy, *Ragi* [*Eleusine coracana*] or *Tenai* [*Setaria italica*] is generally cultivated. The Muduvars have also taken to hunting to suit the country. They catch rats, squirrels, quails, Junglefowl, porcupine, deer and fish. They kill with a blow-pipe and dart many small birds. They will not eat beef, dog, jackals or snakes. The plateau Muduvars will not eat pig in any form also.

235. The Muduvars occasionally practice polyandry. They have their own marriage customs. A couple that propose to marry each other must live in a cave by themselves for a few days. Widow remarriage is permitted, but the widow must be married by the deceased husband's maternal aunt's son and not by his brothers. Divorce is allowed in cases of infidelity or incompatibility of temper. Divorced wives may remarry.

236. As forest labour they are useful as minor forest produce collectors. They are also engaged in clearing coupe or fire lines, and in weeding operations in regeneration plots where use of the bill-hook is involved. Like the Pulayars they also look after village cattle for which they are paid by the landlords of the plains.

237. *Eravalars.*—The Eravalars are a small forest tribe inhabiting generally the foot-hills. They are also called Villu Vedans. Each settlement has a headman or *mooppan* as in the other tribes. There is at present only one settlement of Eravalars near Amaravathi Nagar. They speak Tamil.

238. The Eravalars are less migratory than the Kadars and Malasars. Although essentially cultivators, they are not capable of independent cultivation by themselves and therefore prefer to work as farm labour in the fields adjoining the forests.

239. As forest labour they are useful in regeneration and nursery works.

240. *Amelioration of hill tribes.*—The condition of most of the hill tribes is generally deplorable. Primitive methods of cultivation without resorting to even the elementary precautions to conserve the soil have been primarily responsible for poor yields and in the indulgence of shifting cultivation in the past. With the curbing of shifting cultivation during recent times, the interest of the hill tribes for cultivation has been diminished, since the resultant crops are very poor. Opportunities for *kumri* cultivation in the forest plantations are not normally availed of by hill tribes on grounds of damage by wild animals, although by and large their inherent laziness is responsible for their reluctance. Some of the tribes like the Pulayars would rather prefer to beg and borrow than work. Most of the hill tribes are good in collection of minor forest produce and in clearing and weeding works, but occupations such as these are purely seasonal. Even for regeneration works, very often village labour has to be employed as the hill tribes try to avoid hard work. Some of the hill tribes like the Malasars are comparatively better off as they are more industrious and make good axe-men and elephant attendants, but by and large, most of the other tribes are in deplorable circumstances, as they are utterly dependant on the usurious landlords of the plains who advance them money or grains to be returned by means of labour by working in their fields or by looking after their cattle. The inaccessibility of the forests combined with the dearth of medical and veterinary aid, periodic epidemics of smallpox and yaws, lack of organised help to sell their produce to their best advantage, chronic indebtedness to usurious money lenders, lack of facilities for cheap credit on fair terms are all daily experiences.

241. Of late, a number of improvements have been done towards the amelioration of the hill tribes. The Forest Department has a tribal school at Anaigundi and another school run on similar lines is maintained at Tirumurthinagar by the Harijan Welfare Department. Tribal Co-operative Societies have been organised by the Forest Department in the Tunacadavu and Punachi Ranges. These societies arrange to collect and market minor forest produce to the benefit of the hill tribes who themselves form the members of these societies. The Tunacadavu Hill Tribes' Co-operative Society arranges to sell food-grains and essential provisions to hill labour on credit. Some of the hill-men are employed as Forest Guards and Reserve Watchers. The *Mahouts* and *Cavadies* employed in the elephant camps in Tunacadavu Range are mostly drawn from the Malasar sect. A dispensary with an Assistant Surgeon in charge has been functioning at Topslip from 8th December, 1950. The Harijan Welfare Department has also undertaken several improvement measures such as construction of residential buildings supply of livestock for agricultural work, distribution of sarees and dhoties once in a year, etc. Still a lot has to be done to remove the hill tribes from the clutches of selfish landlords of the plains. Such ameliorative measures as considered necessary are prescribed in Part II.

242. *Census of hill tribes.*—The following statement gives the latest census of hill tribes settled inside the reserved forests :—

Name of settlement.	*Tribes.*	*Men.*	*Women.*	*Children.*	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)
	(a) POLLACHI RANGE.				
Sircarpathy	Malasars.	43	39	54	136

Name of settlement. (1)	*Tribes.* (2)	*Men.* (3)	*Women.* (4)	*Children.* (5)	*Total.* (6)
	(*b*) TUNACADAVU RANGE.				
Erumaparai	Kadars.	10	8	17	35
Anaigundi	Malasars.	14	12	15	41
Varagaliar	Malai Malasars.	12	11	10	33
Do.	Kadars.	14	14	16	44
	(*c*) PUNACHI RANGE.				
Lower Punachi ..	Malasars.	25	22	27	74
Do.	Pulayars.	32	31	16	79
Kadamparai	Muduvars.	14	15	26	55
Kavarkal	Kadars.	31	24	21	76
Nedungundru	Do.	48	39	32	120
Pantrikuzhi	Do.	4	4	2	10
Do.	Muduvars.	17	18	26	61
Udumanparai	Do.	21	17	20	67
Kallar	Kadars.	24	26	14	64
	(*d*) UDUMALPET RANGE.				
Jallimuthanparai ..	Pulayars.	22	19	25	66
Esalthittu	Do.	16	16	35	67
Kurumalai	Do.	30	28	89	147
Balrimalai	Do.	53	47	79	179
Kanuvoipatti	Do.	34	40	37	111
Arugampatti	Do.	2	2	3	7
Moongapallam	Do.	3	3	6	12
Sarakkampatti	Do.	5	4	10	19
Kodanthur	Do.	23	21	39	83
Elumalayan Koil ..	Do.	13	9	..	22
Thalinji	Do.	46	47	86	179
Molkurumalai	Muduvars.	13	12	29	54
Erumaisolai* (Thenangadu)	Do.	12	12	31	55
Karumutti	Do.	18	24	35	77
Amaravathinagar ..	Eravalars.	15	16	12	43

* This settlement extends in Punachi Range also.

243. *Daily wages for labour.*—The prevailing rates of daily wages in the division for skilled and unskilled labour are given below :—

Category of worker. (1)	*Daily wages paid.* *Hill-tribes.* (2)	*Daily wages paid.* *Others.* (3)	*Remarks.* (4)
	(*a*) UNSKILLED LABOUR.		
	RS. P.	RS. P.	
Man mazdoor	1 56	1 75	In the Grass Hills a daily wage of Rs. 1·87 per man mazdoor and Rs. 1·25 per woman mazdoor is paid irrespective of whether they are hill tribes or plains men.
Woman mazdoor	0 96	1 25	

Category of worker.	Daily wages paid. Hill-tribes	Daily wages paid. Others.	Remarks.
(1)	(2)	(3)	(4)
(b) Skilled Labour.			
Axeman	2 75	2 75	
Carpenter I class	..	3 75	
Carpenter II class	..	3 25	
Mason I class	..	3 75	
Mason II class	..	3 25	
Stone cutter I class	..	4 00	
Stone cutter II class	..	3 50	
Quarryman	..	3 00	
Mechanic I class	..	4 00	
Mechanic II class	..	3 00	
Welder I class	..	4 50	
Welder II class	..	3 50	
Plumber	..	3 50	
Tinker	..	3 25	
Painter I class	..	3 50	
Painter II Class	..	3 00	

CHAPTER V—PAST SYSTEMS OF MANAGEMENT.

SECTION 1—GENERAL HISTORY OF THE FORESTS.

244. *History prior to reservation.*—The district of Coimbatore and parts of the adjoining districts of Salem, Tiruchirappalli and Madurai form a compact block of country known as the Kongumandalam with a history of its own even from very early times. In common with other parts of India, this territory too had its vicissitudes of independence and subversion to more powerful neighbours, and a century of peaceful progress hardly escaped disturbance from the aggression of some martial adventurer.

245. Centuries of warfare between the Pandya, Chera, Chola and Pallava Kings for the ascendancy of the one or the other were staged in this district. The Vijayanagar dynasty ultimately held sway for about three centuries, but with its fall in 1565, the kingdoms of Mysore and Madurai waged war against each other for its possession. Mysore held the district for the whole of the eighteenth century, and from her the British conquered it in 1799 at the fall of Seringapatam.

246. Although very little is known about the history of the forests prior to British possession, it is doubtless that there were little restrictions on removals during this period. Historical records show that about two centuries ago there were dense forests covering extensive areas of the plains in the Pollachi and Udumalpet taluks. "This tract is now an open plain, destitute of all except ordinary trees; cultivated and traversed by good roads. The open, sandy and treeless wastes south-east of Udumalpet near the foot of the hills are melancholy instances of reckless tree destruction in long distant periods; these are only a few, though striking instances of the destructive effect of man on the forests of this tract". (F.A. Nicholson—Manual of the Coimbatore District).

247. With the advent of the British Government towards the latter half of the 18th century, started an era of wasteful extraction of teak from the Mount Stuart forests in the shape of large planks for the Indian Nevy at Bombay and for the arsenal at Madras. About the middle of the nineteenth century, the increasing shortage of teak and the high prices prevalent induced the British Government to appoint Major F.C. Cotton, Civil Engineer, Coimbatore, to investigate teak supplies and report. This Officer after a rough reconnaissance of the Mount Stuart forests reported that there

was an unlimited supply of large teak trees which can be felled and sawn into planks. His proposals were to exploit the teak as fast as possible by appointing a special officer for this purpose. No suggestions were however made to regulate the yield or replace the growing stock removed. As a result of these recommendations, Captain J. Michael of the Madras Infantry was appointed as the first Superintendent of the Mount Stuart Forests under the control of the Civil Engineer, an arrangement which continued up to 1853 when the control passed to the Collector of Coimbatore.

248. In 1851, Captain Michael under orders of Government negotiated a six-year lease with the Nambidi of Kollengode over the Thekkadi leased forests which now fall part of the Kerala State. On the expiry of the first lease, a second lease for a period of 99 years was executed in 1857.

249. In 1850, Michael constructed a road 10.46 kilometres long from Sichali to Topslip at a cost of Rs. 4,139. Only the last two kilometres of this road lies in the Thekkadi leased forest. Timber was carted along this road to Topslip and thence skidded down the ghat to the *adivaram* by dry slide (whence the name 'Topslip'), carted to Palghat, floated down the Bharathapuzha to Ponnani and shipped to the Naval yard at Bombay. Timber for the Madras Arsenal was carted to Vangal near Karur on the Cauvery, floated down that river to the sea, and shipped thence. In 1856, Michael also aligned a ghat road (' Michael's trace ') to replace the ' slip ' which was however constructed only in 1868 at a cost of Rs. 4,009. This road was in use for 56 years until it was replaced by the present ghat road in 1924. Fellings continued up till 1880, when it was decided to give rest to the forests. Most of the fellings done during this period were confined to the Thekkadi forests, although the British portion did not escape in anyway.

250. The rest of the forests in the division were taken charge of by the Jungle Conservancy Department which was formed in 1868. This organisation appointed Overseers and Sub-Overseers to be in charge of the forests. All removals of forest produce were thereafter controlled by permits. Free permits were issued up to 1872 for bona fide domestic and agricultural purposes. Teak, Sandalwood, *Dalbergia latifolia, Pterocarpus marsupium, Acacia sundra, Acacia arabica, Anogeissus latifolia, Tamarindus indica* and *Terminalia arjuna* were not sold on permits, nor green fuel. The fees charged were as follows :—

	Head-load. (1)		*Cart-load.* (2)	
	RS.	P.	RS.	P.
Timber	0	09	1	25
Dead fuel	0	02	0	31
Bamboos	0	03	0	62

251. In 1872, the Collector replaced the Jungle Conservancy Department and Officers, Foresters and Forest Guards took the place of Overseers and Sub-Overseers.

252. *History after reservation.*—In 1882, the Madras Forest Act was enacted and reservation of the forests in the tract was commenced. In 1883, the Tunacadavu Reserved Forest was notified under Section 16 of the Act. Most of the other reserved forests of the division were notified between 1883 and 1885. The Thekkadi leased forest was notified as a reserved forest in 1918. This forest become part of the new Kerala State on 1st November 1956, consequent to the general reorganisation of States in the country on a linguistic basis.

253. In 1886, a contract for the removal of rosewood and *Vengai* from the Lower Punachi forests was entered into, the timber being skidded down extensively from Punachi to Navamalai. The details of this contract are not known, but it is believed that the fellings indulged in were extensive.

254. After the reservation of the forests was complete, European planters got interested in the best forests of the Anamalais. In 1896, Government approved the grant of forest areas for the raising of plantation produce such as coffee, tea, and

cardamom, and since then an area of 19,114.13 hectares of evergreen forests around Valparai was assigned for this purpose. The assignment permitted the planters the use of any timber from their area for their own purposes but not for sale. Much timber was therefore felled and wasted on this account. The areas assigned have been disreserved since 1926, and excluded from administration.

255. In 1921, the Uthiyur, Thalavoipattanam, Periamanimalai and Attamalai reserves in the Dharapuram Taluk were transferred to Panchayat management based on a general policy formulated by the then Government to vest the control of all forests in the plains classified as ' minor ' under the village panchayats. As the panchayat management was bad, the Government ordered the Forest Department to take over these forests in 1951. These forests were taken over by the Department during the same year in a virtually denuded condition.

256. In 1927, an area of 9,307.87 hectares of virgin evergreen forests in the Kallar Valley was ordered to be set apart for the planting of Cinchona under the auspices of a separately constituted department. An area of 1,740.17 hectares was thus planted up with Cinchona by 1934. In 1940, Government ordered extension of cinchona by planting in the Kallar Valley at a rate of 607 hectares annually for five years. Another area of 252.93 hectares in the Kadamparai Valley was leased to one Mr. Gerry for a period of 15 years for planting with cinchona, but the area was subsequently handed over to the Cinchona Department. By 1949, a total area of 3,570.57 hectares had been handed over to the Cinchona Department.

257. With the discovery of newer and more powerful antimalarial drugs after the war, the demand for quinine progressively fell to almost nil. Replanting of cinchona areas was therefore stopped under the orders of Government. Efforts were therefore made to recover these areas back from the Cinchona Department in order to plant them with fast grown tree species suitable as industrial raw material. An area of 24.28 hectares was accordingly resumed from the Cinchona Department during 1962. Another bit of 40.47 hectares was resumed from the Cinchona Department in 1963. Government have again ordered in G.O. Ms. No. 626, Food and Agriculture, dated 28th February, 1964, that an area of 40.47 hectares should be handed over to the Forest Department during 1964. The question of handing over the rest of the areas also to the Forest Department is under the consideration of Government.

258. In 1938, the Dhali Reserved Forest was disreserved. This was followed in 1943 by the disreservation of a compact block of 264.26 hectares in the Anamalai Reserved Forest adjoining the Navalodai river in Udumalpet Range.

259. The tract underwent far reaching changes after 1954. During the same year, the Amaravathi Project was taken up by the Public Works Department and completed in 1957. This project which resulted in the construction of a dam across the river Amaravathi has caused the submergence of a total area of 778.40 hectares in the Udumalpet Range. The submergible areas have been handed over to the control of the Public Works Department, but legally continue to remain as reserved forest. The inter-state Parambikulam-Aliyar multi-purpose project which has been ushered in 1958, envisaged the construction of a chain of six dams within this division alone with linking canals and tunnels which will result in large areas being submerged or otherwise disafforested. A part of the project has been completed at the time of writing this plan, but the total area affected will be known only in 1966 when the entire project will be completed.

260. *History of working plans.*—The scientific management of the forests of the division commenced only with the introduction of systematic working plans. A brief history of the working plans drawn up to date is presented below :—

261. In 1889, J. S. Porter drew up a working plan for about 971 hectares of forest south of Sethumadai, to be worked for fuel on a rotation of 12 years. This was subsequently revised by H.B. Bryant, but neither plan was sanctioned.

262. In 1896, Gass prepared a working plan for the Ayerangal Fuel Series which was sanctioned. In 1902, Foulkes prepared a working plan for the Pollachi Range treating Gass's working plan as a part of his plan. This plan too was sanctioned. Foulkes also prepared a working plan for the Udumalpet Range, in 1902. This plan was not sanctioned as such, but a summary of its prescriptions was approved and given effect to.

263. In 1906, Arbuthnot prepared a working plan for the Ulandi Valley. This plan which was known as the Varigali Valley Working Plan was subject to the construction of a road over the Vengoli—Umayamalai Bridge. As the contemplated road did not materialise, the plan had to be shelved after one coupe was worked in 1911–12.

264. Arbuthnot also prepared a working plan for Punachi which was sanctioned in 1908. This remained in force till 1925.

265. In 1959, Arbuthnot wrote the first working plan for the Mount Stuart forests lying east of the Malabar boundary and north of the Vengoli—Umayamalai ridge. The plan prescribed certain silvicultural operations without any fellings. They were carried out to a certain extent but owing to lack of control, the results of the treatment have been lost. During the same year, a plan for Thalinji was also prepared by the same officer, but this was not put into operation since there was no market and the question of grazing had to be considered separately.

266. In 1916, C. C. Wilson was appointed as Working Plan Officer to prepare a working plan for the Mount Stuart forests inclusive of the Thekkadi leased forests. As C. C. Wilson was deputed for military duty after preparing the Reconnaissance Report, H. F. A. Wood took over the preparation of the working plan which was completed in 1918 on the lines proposed by Wilson generally. Wood's plan which came into force on 1st April 1919, operated until 1931.

267. In 1919, Habibullah revised Foulkes' plan for the Udumalpet Range. The revised plan was operated until 1934.

268. In 1920, E. M. Crothers drew up a 'Summary of prescriptions' for fuel working in the Pollachi Range to be worked from 1921-22. In 1923, these prescriptions were embodied in a regular working plan prepared by W. G. Dyson for the Pollachi Range.

269. In 1965, Coode revised Arbuthnot's plan for the Punachi Working Circle. The revised plan was in force until 1934.

270. In 1927, M. V. Laurie was appointed to revise Wood's plan for the Mount Stuart forests. Laurie's plan which came into force on 1st April 1931, was for a 10 year period up to 31st March 1941.

271. In 1935, A. N. Sarma prepared a ten year plan for the whole division, excepting the Mount Stuart forests which were then covered by Laurie's plan. Sarma's plan was in force from 1935–36 to 1944–45.

272. In 1939, T. V. Venkateswara Ayyar who was appointed as Working Plan Officer to revise the existing plans in force, prepared the first consolidated working plan for the whole Coimbatore South Division. Although the period of this working plan was only 10 years from 1941–42, the prescriptions, felling and regeneration programmes were prepared for 15 years.

273. Venkateswara Ayyar's plan was revised by K. A. Bhoja Shetty who prepared a fifteen year plan which came into effect from 1954-55. When the revision of the working plan for the division was taken up by the writer on 12th July 1972, Bhoja Shetty's plan was in force.

274. *Administrative history of the division.*—Even prior to reservation, the forests of the Anamalais were included in a separate division called the Coimbatore South Division, with the rest of the forests in the district included under a separate unit known

as Coimbatore North Division. In 1879–80, the North and South Coimbatore Divisions were amalgamated into one and the Anamalai forests were reduced to the status of a Range in charge of a Sub-Assistant Conservator. The Coimbatore South Division again became a separate division in 1885, but then it included also the forests constituting the present Bolampatti, Perianaickenpalayam and Mettupalayam Ranges of the Coimbatore Central Division. In 1906, the Palghat Range in Malabar District was also transferred to the Coimbatore South Division. In 1910, when the forest charges in Coimbatore District were divided into four divisions (North, South, and Central Coimbatore divisions and Kollegal), the areas constituting the present Bolampatti, Perianaickenpalayam and Mettupalayam Ranges were included in the Coimbatore Central Division, while the Palghat Range continued to be in the Coimbatore South Division. In 1921, the Coimbatore Central Division was abolished but the Palghat Forest Division was created during the same year. The Palghat Range was included in the new division, and the Coimbatore South Division was left to comprise of areas in the Anamalais only.

275. In 1955, the headquarters of the division which was at Coimbatore for over a century was shifted to Pollachi. In 1956, the Thekkadi leased forests became part of the new Kerala State as a result of ' States Reorganisation '. In 1957, the Bolampatti, Mettupalayam and Mettupalayam Irrigated Plantation Ranges were transferred to the Coimbatore South Division from the Coimbatore North Division. In 1959. the Mettupalayam and Irrigated Plantation Ranges were reverted back to the Coimbatore North Division, while the Bolampatti Range continued to be part of the Coimbatore South Division. Early in 1960, a further reorganisation took place. The Coimbatore North and South Divisions were again divided into 3 units (North, South and Central Coimbatore Divisions), and the Bolampatti Range was included in the Coimbatore Central Division.

SECTION 2.—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

276. *General.*—In preparing the 1908 plan for the Punachi Working Circle, Arbuthnot divided an extent of 1,057.28 hectares in the Lower Punachi Forests into 20 compartments for purposes of location, management and description.

277. Later, M. V. Laurie in his Mount Stuart plan divided a major portion of the Tunacadavu Range into 4 convenient blocks, viz :—

(*i*) The Mount Stuart Block consisting of all the forests east of the Coimbatore —Malabar Boundary and north of the Vengolimalai—Umayamalai ridge.

(*ii*) The Thekkadi Leased Forest Block consisting of the whole of the leased forests.

(*iii*) The Ulandi Block consisting of the forests lying south of the Vengolimalai—Umayamalai ridge and north of the Nadumalai—Olaivaraimalai ridge.

(*iv*) The Palakadavu Block to the south of the Nadumalai ridge.

278. The area comprising of these 4 blocks was divided into 12 permanent compartments regardless of working circle boundaries and numbered serially for the whole area as such. To this, 3 more compartments (numbers 103 to 105) in the Palakadavu Valley were added by Venkateswara Ayyar. He also designated the Punachi Working Circle as the Punachi Block. To this, a small area of 12.14 hectares adjoining compartment 20 was added on and designated as (sub?) compartment 20 (a).

279. Of the 105 compartments in the Tunacadavu Range, compartments 1 to 51 and 54 to 57 comprising of the Thekkadi Leased Forest Block were transferred to the Kerala State in 1956 following ' States Reorganisation '.

280. Although regular compartment files were opened for all the compartments constituted, subsequent compartment histories have not been posted regularly thereby defeating the very purpose of forming these compartments. The compartment boundaries have also not been maintained in the field wherever artificial boundaries have been formed.

281. The past systems of management of the division and their results are briefly discussed below :—

A. DECIDUOUS TIMBER FORESTS.

282. The deciduous timber forests in the division are confined to the Tunacadavu Range, the Punachi Block and the Villoni Valley. The upper slopes of the Pollachi Range south of Sethumadai also do contain some deciduous timber, but since these forests were never worked under any of the working plans prepared so far, they are excluded from the scope of this discussion. The past management of the deciduous timber forests in each of the three localities mentioned above are described and discussed separately as the treatment given for each of these areas varied right from the beginning.

1. *Tunacadavu Range.*

283. Prior to 1916, no systematic efforts were made to either regulate the yield or replace the growing stock removed. Earlier administrators like Major Cotton and Captain Michael were only interested in exploiting teak as fast as possible. Even a teak rotation was considered unnecessary and Major Cotton made the curious suggestion that teak would not grow where it had been grown before, presumably because he had noticed that the large trees felled did not coppice.

284. The earliest attempt at regeneration of teak was made by Captain Hamilton in 1856. In 1871, Douglas raised a plantation of 3.24 hectares at Topslip known as the 'Mudi' plantation, but neither of these early efforts can now be located. In 1872, a further 2.43 hectares was planted at Waterfall which now forms the oldest plantation in the division. The then management conceived that selection fellings would induce natural regeneration of teak and other valuable species in the gaps thus created, but their calculations were upset by the enormous weed growth and frequent fires which wiped off any semblance of regeneration. The limitations of this system were realised in 1885 and Porter who wrote a working plan for Thekkadi leased forests recommended the *mode deseclaircies* or the clearfelling and planting system. In 1894, E.P. Popert recommended improvement fellings combined with cultural operations. Teak trees over 0.61 metres in diameter were not to be felled unless there was sufficient natural regeneration and all trees of less valuable species dominating teak, rosewood and *Pterocarpus marsupium* were to be felled or girdled and dibbling of seeds of these 3 valuable species was to be done in gaps in conjunction with *kumri*. Between 1898 and 1911, attempts were made to obtain natural regeneration by felling bamboos and inferior species, but satisfactory stocking was not achieved. Between 1908 and 1910, Lushington felled all bamboo growth in an area, burnt it, and dibbled teak seed with fair success, but lack of subsequent tending resulted in the failure of the experiment. Later the technique of dibbling germinating teak seed obtained from seed dumps promoted earlier germination and consequently faster growth of the seedling. The dumps were made by mixing the teak seed with approximately twice the quantity of soil lightly scraped from the burnt area. None of these early efforts were however really successful as complete removed of canopy was not done, and proper weedings and climber cuttings during the first few months were not realised. Between 1912 and 1915, an area of about 45.33 hectares was clearfelled and planted with teak and rosewood by Fischer, south of the old tram-line near Topslip. Guinea grass was unfortunately introduced into the area with a view to suppress weed growth, but this attracted wildlife in large numbers, with the result the teak was destroyed over much of the area. The plantations did so badly that it was decided to give up planting as a method of regeneration, and to rely only on natural regeneration.

285. Fortunately, Hugo Wood who succeeded Fischer was not discouraged and persisted in his efforts at artificial regeneration of teak. He carried out experiments both near Mount Stuart Bungalow and in the Ulandi Valley in 1916 and 1917, which proved that teak plantations could be raised successfully from seed and at a reasonable cost. He observed that complete clearing and burning, dibbling and proper weedings were essential to ensure success, and drip from trees overhead was inimical to proper growth.

286. *Wood's working plan* (1919–20 *to* 1930–31).—Wood in preparing the Mount Stuart working plan conducted a 50 per cent enumeration of the whole forest and calculated the growing stock. Two working circles were constituted by him :—

(*i*) A Mount Stuart Working Circle, comprising of an area of 6,154.46 hectares in the Mount Stuart plateau (inclusive of a major portion of the Thekkadi leased forests), and (ii) A Ulandi Timber Working Circle comprising of an area of 1,999.15 hectares in the Ulandi Block. The 'selection system' was prescribed with an exploitable girth of 2.13 metres and over. The selection rotation was 150 years and the feeling cycle 50 years. An extent of 10.12 hectares of the best locality within each coupe was to be clear-felled burnt and regenerated with teak by dibbling, but a greater area could be attempted if sufficient labour was available. *Lantana* was to be eradicated and teak seed sown in the area so dealt with. The yield for the first felling cycle of 50 years was calculated at not lesst han 2,831.08 cubic metres per annum of timber of 2.13 metres girth and over. The annual coupes were laid out, however, to give approximately equal yields of 2,525.20 cubic metres every year, although the reason for adopting this figure was not given.

287. *Results.*—The quantity of timber felled in any one year did not correspond either with the estimated out-turn of the calculated yield. The felling sequence prescribed in the working plan was also not followed. Although the working plan contemplated an annual regeneration area of 10.12 hectares only, even areas over 100 hectares were regenerated in a year. Bulk of the areas thus regenerated between 1916 and 1930 were raised in the Thekkadi leased forests but with the reorganisation of States in India in 1956, these forests along with the plantations raised therein were transferred to the Kerala State. No clearfelling or planting was done in the Ulandi Block for want of communications. Teak was planted pure before 1926, except in certain swamy localities where *Terminalia tomentosa* was introduced. In 1926, 1927 and 1928, alternate strips of *Dalbergia latifolia* were sown. In 1929, pure teak was again reverted to except in a small area were teak and rosewood were sown at the same stake. The technique adopted during the period of Wood's working plan was to clear and burn the area early in March, followed by staking at an espacement of 1.37 metres X 1.37 metres. Teak rosewood and other species were sown at each stake. Weedings were commenced in May before the teak had germinated and proceeded almost continuously to the end of September or early October, the ground being gone over six or seven times. Casualties were replaced during weeding by transplanting excess seedlings at stakes, or by germinating seeds or nursery transplants. *Kumri* was tried in the 1928 and 1930 plantations without success and was therefore given up. Thinnings were considered necessary in the best quality areas in the 5th or 6th year. A cleaning and climber cutting was done just before thinning, as it was found to be beneficial in preventing breaking of the crowns of trees to be retained.

288. Wood's working plan gave the impetus for the establishment of teak plantations in the division. The plan however had the following defects :—

(*i*) " When large areas of over 60 hectares or more were taken up for regeneration, the total calculated yield was claimed from clearfellings alone, that there was no need to do any selection fellings. The forest was therefore not worked to its capacity as parts requiring felling were left unfelled.

(*ii*) In selecting regeneration areas of 40 hectares or more within a coupe of about 202 hectares, it frequently happened that unsuitable areas were included resulting in failures " (T. V. Venkateswara Ayyar).

(*iii*) " The system of sowing also did not work well, as teak seed at Mount Stuart has the peculiar phenology of germinating (sometimes even right up to August) and most often the seedlings that germinated just before a dry spell before or during the moonsoon, died fo rlack of moisture. Casualties replaced were invariably very heavy and in some years as much as 90 per cent of the crop required replacement by transplants." (Venkateswara Ayyar).

289. *M. V. Laurie's working plan* (1931-32 to 1940-41).—M. V. Laurie made a complete enumeration of the entire deciduous forest in the Mount Stuart and Thekkadi Blocks combined with its detailed topographical survey on a scale of 12 inches to a mile (1 centimetre = .0528 kilometres). Volume out-turn tables compiled from yield figures of past fellings and the total volume per 0.6 hectare unit was calculated and posted on a 'cover map'. For the Ulandi and Palakadavu Blocks, only a rough stock map was prepared on a four inches=one mile (one centimetre=0.158 kilometre) scale map and enumerations were conducted in sample strips over 17.2 per cent of the area.

290. Laurie divided the entire area into 2 working circles:—(i) A Clearfelling Working Circle which included all plantations formed prior to the commencement of the plan, and all areas proposed for future conversion in the Mount Stuart and Thekkadi Blocks; and

(ii) A Selection Felling Working Circle consisting of rest of the deciduous timber forests which were considered by him as unfit for raising teak.

291. *The Clearfelling Working Circle.*—The Clearfelling Working Circle was divided into 2 felling series: (*a*) The Mount Stuart Felling Series, and (*b*) The Ulandi Felling Series.

292. The Mount Stuart Felling Series comprised of an area of 3,516.31 hectares including 751.50 hectares of teak plantations formed prior to the commencement of the plan and all areas proposed for future conversion in the Mount Stuart and Thekkadi Blocks. The rotation was fixed at 100 years which gave an annual regeneration area of 35.21 hectares. The annual yield was fixed by Von Mantel's formula based on the results of the complete enumeration that was carried out. The difference between the actual yield from the regeneration area and the calculated annual yield was to be made up by subsidiary fellings in areas not coming up for clearfelling within the next period of 25 years, all saleable timber over 2.29 metres in girth being removed over a sequence of areas prescribed until the required out-turn was obtained. Teak was to be the primary species for regeneration, the chief auxiliary species being *Dalbergia latifolia* and *Pterocarpus marsupium*. The espacement was to be 1.37 metres x 1.37 metres, but since stump planting was prescribed, it was expected that an espacement of 1.83 metres x 1.83 metres would be sufficient, but the decision was left to be taken in the course of experience. The auxiliary species were to be introduced by sowing in the same patch as the teak. During the first year, continuous cutting of weed growth throughout the year was prescribed with a *mammutti* scraping to be done in September and another in December. All bamboos were to be cut back to ground level and *Lantana* uprooted. Casualties were to be replaced between 15th July and 15th September by transplanting seedlings from one patch to another. During the second year, cutting back of all weed growth, pruning of double leaders and large persistent side branches, coppicing of damaged plants, cutting back of bamboo and uprootal of *Lantana* were prescribed. Two or three such weedings were considered sufficient. In the second year, individual casualties were not to be replaced as they would only be suppressed by the adjacent stems, but groups of failures were to be replanted. In the 3rd year, it was considered necessary to keep the heads of the backward plants free, cut creepers, coppice damaged teak and cut bamboos. The necessity to preserve an admixture of species like *Lagerstroemia lanceolata*, *Grewia tiliaefolia*, etc., in the understorey was emphasised by Laurie with a view to improve the soil. Miscellaneous tree species interfering with the teak were therefore suggested to be merely pollarded instead of being coppiced, as coppicing resulted in faster growth which would again interfere with the teak in a short time. Thinnings were prescribed in the 6th, 12th, 18th, 30th and 50th years' but the District Forest Officer was given the liberty to alter them if he considered it necessary. A climber cutting was to be done shortly before each thinning.

293. The Ulandi Felling Series was to constitute all areas that are clearfelled and planted in the Ulandi and Palakadavu Blocks as per prescriptions of this plan. These areas formed part of this Selection Working Circle but when clearfelled and planted with teak were to be transferred to the Clearfelling Working Circle. An area of 20 hectares

was prescribed to be clearfelled and planted with teak stumps at an espacement of 1.83 metres by 1.83 metres. Thinnings were prescribed in the 5th, 11th, 17th, 20th and 40th years. The method and intensity of thinning to be adopted was the same as in the **Mount Stuart Series**.

294. *The Selection Felling Working Circle.*—The Selection Felling Working Circle comprised of an area of 7,996.60 hectares. The working circle was divided into 2 felling series :—(*a*) The Mount Stuart Felling Series, and (*b*) The Ulandi Felling Series.

295. The Mount Stuart Felling Series comprised of an area of 2,931.14 hectares in the Mount Stuart and Thekkadi Blocks. The annual yield was calculated according to a modified Von Mantel's formula and based on the results of the complete enumeration of the growing stock that was carried out over the entire Mount Stuart plateau (*Vide* paragraph 289). The exploitable girth was fixed at 1.98 metres at breast height and a rotation of 160 years was estimated as required to grow a teak tree to this size. The felling cycle was fixed as 40 years. As the calculations showed that the estimated yield could be obtained by felling all saleable trees over 2.59 metres in girth at breast height, only trees above this girth were to be felled. The working was prescribed to be done departmentally. Artificial regeneration in the gaps created by felling was prescribed as an experimental measure. The species for regeneration were to be teak, rosewood and *Pterocarpus marsupium*.

296. The Ulandi Felling Series comprised of an area of 5,063.94 hectares in the Ulandi and Palakadavu Blocks. This series was prescribed to be worked through the agency of contractors as the only transport route from this area was through the Cochin Forest Tramway. The exploitable girth was fixed at 1.98 metres at breast height due to the presence of a large amount of overmature timber, but the rotation was arbitrarily fixed at 100 years. The felling cycle was fixed at 40 years as for the Mount Stuart Felling Series. Artificial regeneration of gaps created by felling was also prescribed.

297. *Results.*—The results of working during the period 1931–32 to 1940–41 are briefly summarised below :—

298. *The Clearfelling Working Circle.*—In the Mount Stuart Felling Series, the actual yields obtained were generally considerably lower than the estimated yields, particularly so in the case of species other than teak. The subsidiary fellings were held in abeyance till 1936–37 as a result of a slump in the Pollachi timber market. As anticipated by the working plan, stump planting of teak at an espacement of 1.83 metres by 1.83 metres was adopted as the standard practice with effect from 1932 as elsewhere in the State. The auxiliary species were introduced in the same patch as the teak until 1939, after which this was discontinued under the orders of the Chief Conservator of Forests. Of the plantations raised in the Mount Stuart Series during Laurie's working plan period, the earlier plantations, viz., 1932, 1934 and portions of 1931 and 1935 plantations are still in Madras; all the rest now form part of the new Kerala State.

299. In the Ulandi Series, the conversion of areas in the Palakadavu Valley into teak plantations at an average area of 20 hectares a piece was carried out regularly. Regeneration was combined with *kumri*, hill paddy being the agricultural crop. From 1935, the regeneration was done departmentally since the contractor's work was not satisfactory. Regeneration work in the Ulandi Series was stopped in 1938 as it was decided to club this series with the Mount Stuart Series. Of the plantations raised in this series, those formed between 1932 and 1935 were successful; the rest were mostly failures or had patchy success. The plantations were thinned, but the out-turn could not be sold.

300. *The Selection Felling Working Circle.*—The Mount Stuart Felling Series was worked regularly between 1933 and 1940. There was not much variation between the actual and the estimated yield. In the Ulandi Felling Series, a contract for the purchase of timber was signed by a Cochin Contractor named John Kuruvilla for a period of 5 years. The contractor was required to fell and remove a minimum of 1 lakh of cubic

feet (2,831.68 cubic metres) per annum. The logs were to be measured at stump site and seigniorage rates paid to Government. The contract was extended up to 1940, by which time a total of 14,276.91 cubic metres of teak, 6,818.64 cubic metres of rosewood and 1,580.87 cubic metres of other species were removed, the seigniorage collected amounting to Rs. 4,25,045 or an average of Rs. 0.53 per cubic foot or Rs. 18.73 per cubic metre. The actual yield was 22,534.84 cubic metres against 22,653.44 cubic metres forecasted.

301. In both the series, the gaps were regenerated every year between 1933 and 1936 with partial success, but the cost was found to be even more than regular clearfelling and planting. Gap regeneration was given up in 1937. The results of clearfelling and planting in the Ulandi Series are already described under the Clearfelling Working Circle.

302. *T. V. Venkateswara Ayyar's Working Plan* (1941–42 *to* 1950–51).—T. V. Venkateswara Ayyar also divided the deciduous timber forests of the Tunacadavu Range into 2 working circles as in the previous plan. The Clearfelling Working Circle of Laurie's plan was renamed as the Conversion Working Circle and the Selection Felling Working Circle was referred to as the Deciduous Selection Working Circle.

303. *The Conversion Working Circle.*—Laurie had taken up only the best areas for conversion into teak excluding all non-teak and doubtful areas. Venkateswara Ayyar rightly considered that it would be preferable to raise artificially teak plantations of even a low quality class rather than rely solely on natural regeneration in a selection forest. He accordingly transferred some 868 hectares from Laurie's Selection Felling Working Circle to his Conversion Working Circle bringing the area of the latter to 6,520 hectares inclusive of the existing teak plantations and the area suitable for planting in Ulandi and Palakadavu Blocks. Only one felling series, viz; the Mount Stuart Felling Series was constituted in the Tunacadavu Range which included areas in the Ulandi and Palakadavu Blocks also, but no planting was prescribed in the latter during the period of the plan. The conversion rotation was tentatively reduced to 80 years giving an annual clearfelling coupe of 81 hectares, as it was found that the diameter curves of the Tunacadavu plantations indicated a decidedly faster rate of diameter increment, quality for quality, compared with All-India averages up to 25 years. It was presumed that this faster rate of growth would in all probability continue giving an average 1.83 metres girth in about 80 years. Subsidiary fellings were prescribed to be carried out over an average area of 55.85 hectares annually on areas which would not come for conversion during the 15 years period of the plan, the girth limit being 2.29 metres at breast height.

304. Teak was prescribed to be the primary species for regeneration. Venkateswara Ayyar discontinued Laurie's prescription of raising mixtures on the consideration that they caused difficulties at the time of thinning. He also felt that rosewood being slower grown than teak, a longer rotation would be necessary for the former thereby complicating management. However, *Dalbergia latifolia* or *Dalbergia sissoides* was suggested for sowing on rocky areas of limited extent that may exhibit themselves on clearfelling, if the District Forest Officer considers that these species are likely to grow well in such areas.

305. Venkateswara Ayyar envisaged that the plantations would be raised under the *kumri system*. Hence the number of weedings and other cultural works to be done during the first year was not prescribed, as the *kumridars* were expected to keep the area weeded all the time. Replacement of casualties was prescribed to be done up to the end of August, as it was found that later replacements don't get sufficiently established before the hot weather. The 2nd and 3rd year weeding and tending operations prescribed were the same as that by Laurie.

306. With the very large extension of teak plantations, Venkateswara Ayyar realised the necessity of simplifying the art of thinning so that it could be done satisfactorily by officers and subordinates with a little practical experience. He prescribed mechanical thinnings in the 4th and 8th years in good quality plantations

in which the stand was to be reduced to 2.59 metres by 2.59 metres and 3.6 metres by 3.6 metres respectively by removing the alternate diagonal and alternate rows in the successive thinnings. The District Forest Officer was to inspect a plantation and decide what portions were to be mechanically thinned and what portions left unthinned till the 8th year or to be selectively thinned. Further thinnings were to be selective on the basis of top height and relative spacing given in the All-India Teak Yield tables of Laurie and Sant Ram. All suppressed teak was to be removed and miscellaneous species were to be retained unless likely to interfere with a retained teak.

307. *The Deciduous Selection Working Circle.*—This working circle comprised of all the deciduous timber forests considered by Venkateswara Ayyar as unsuitable for clearfelling and conversion into teak. Two felling series were constituted in the Tunacadavu Range.—(*a*) The Tunacadavu Felling Series (in place of Laurie's Mount Stuart Felling Series) comprising of an area of 2,563.69 hectares, and (*b*) The Ulandi Felling Series (2,023.43 hectares). The latter had been so heavily exploited between 1931 and 1940 that complete rest was prescribed for the period of the working plan. In the Tunacadavu Series (which largely consisted of areas in the Thekkadi leased forests), the girth limit was to remain at 2.29 metres, all dead, dying and fallen trees of saleable species being also prescribed to be extracted, the annual area averaging 73.25 hectares. The annual coupes were divided and marked on the maps. No regeneration (either natural or artificial) was prescribed.

308. *Results.*—The results of working during the period of Venkateswara Ayyar's working plan are summarised below :—

309. *The Conversion Working Circle.*—All the areas clearfelled and converted during the period of Venkateswara Ayyar's plan are now in Kerala State. Detailed comments on the result of his prescriptions are therefore not made. The thinnings prescribed in the plan were carried out regularly, but the following comments made by Bhoja Shetty on the results of the prescriptions deserve reproduction here. "The discretion given to the District Forest Officer as to whether a plantation should be mechanically or silviculturally thinned partially or wholly in the fourth and eighth years would have been excellent had it been possible to retain District Forest Officers for long periods in the division so that they gained sufficient experience to be good judges on these matters. Under the existing system of frequent changes of District Forest Officers it was not possible to ensure that this discretion was always properly exercised. It would have been better to prescribe strictly mechanical thinnings in the fourth and eighth years, for if a plantation had failed in parts, refraining from thinning mechanically could not improve it whereas a plantation thinned mechanically in the fourth year created far less difficulty to the marking officer in thinning mechanically or silviculturally in the eighth year, than a plantation thinned mechanically and silviculturally in patches in the fourth year. Supervision and check of thinning operations would have also been greatly simplified".

310. *The Deciduous Selection Working Circle.*—In actual working, neither the sequence of fellings or the year of working prescribed in the working plan was followed, as areas in excess of the working plan were felled in the Conversion Working Circle. From 1947–48, the girth limit was further reduced to 1.98 metres for teak and rosewood. Owing to these irregular fellings, it is not possible to compare the actual yield with the forecasted yield.

311. *K. A. Bhoja Shetty's Working Plan* (*1954–55 to date*).—The prescriptions of Bhoja Shetty's plan were essentially the same as in the earlier plan except for minor changes. The Teak Conversion Working Circle of Venkateswara Ayyar was renamed as the Teak Plantation Working Circle while the Deciduous Selection Working Circle was retained as such.

312. *The Teak Plantation Working Circle.*—Unlike in the previous plan, Bhoja Shetty constituted a separate felling series for the Ulandi and Palakadavu Blocks to be called as the Ulandi Felling Series in addition to the usual Mount Stuart Felling Series. The rotation was kept at 80 years as in the previous plan. Clearfelling and planting

with teak at an average annual rate of 52.6 hectares in the Mount Stuart Felling Series and 26.7 hectares in the Ulandi Felling Series were prescribed. The latter was subject to the formation of an extraction road to serve the Ulandi Valley and provision of housing and other facilities for the working staff in this inhospitable area. A 10 per cent enumeration was carried out by the method of random strip sampling in areas which were to be clearfelled and planted for the next 15 years in the Mount Stuart Felling Series, in order to estimate the yield from each annual coupe. With a view to ensure as complete utilisation of the trees in the coupe as possible, the top ends left in the coupe after departmental conversion of timber was for the first time prescribed to be sold in auction for removal as fuel and small timber, subject to the condition that materials less than 45 centimetres in girth at the thicker end may not be removed, in order to provide adequate material for ensuring a good burn. Bhoja Shetty suggested the planting of teak pure, but for areas which tend to develop swampy conditions after clearfelling, one year old *Eucalyptus robusta* seedlings were prescribed.

313. During the first year, four weedings including uprootal of bamboo and *Lantana* were prescribed. During the second year, two or three weedings were considered sufficient with uprooted of all *Lantana* and cutting of bamboo regrowth. Damaged plants were to be cut back and multiple shoots reduced to one leader. A general pruning over the entire plantation up to a height of about 1.83 metres was also prescribed to be done with the last weeding. During the third year, one tending consisting of pollarding of miscellaneous species interfering with teak, cutting of bamboo, climbers and creepers, with a pruning if necessary was to be done.

314. Bhoja Shetty prescribed a system of 'elite thinnings' which was ordered to be practised all over the State by the then Chief Conservator of Forests, S. K. Bassu. As teak is wholly intolerant of interference even from the side, it was considered best that as many stems of the final crop as possible should be selected very early in the life of the plantation. The earlier these 'elites' are set apart, the better it was considered, as they could be more evenly spaced out without any bias in favour of individual plants that might have developed better than its neighbours. One 'elite' was to be selected in each quarter square chain of a plantation subject to the condition that each elite is 7.32 metres away from its neighbour in any direction. This contributes to selection of 99 'elites' per hectare. The selected 'elite' stems were to be marked at breast height with a ring of paint of any distinctive colour and the trees numbered serially above the ring mark after smoothening the bark. All subsequent thinnings were to be around the 'elites' in order to give them the most optimum space for development.

315. As the method was being introduced for the first time in the division, only plantations less than 20 years of age were to be thinned as per the new system; in older plantations the existing practice was to be continued. The thinnings were prescribed to be carried out at the ages of 4, 7, 12, 20, 29 and 40 years. For plantations low in quality or backward in conditions, the first two thinnings were to be replaced by a single thinning at any suitable age between the ages of 4 and 7. The selection of elites and marking for thinnings were all prescribed to be carried out by the District Forest Officer or a Gazetted Assistant. All miscellaneous species suppressing or likely to suppress teak were prescribed to be pollarded at a height of about 1.22 metres during thinnings in order to discourage growth competing with the teak while at the same time ensuring a good understorey.

316. Bhoja Shetty also prescribed under-planting in the teak plantations over about 4 hectares annually. The under-planting was prescribed to be done immediately after the penultimate thinning. *Evodia lunu-ankenda* and *Swietenia macrophylla* were the species recommended.

317. *The Deciduous Selection Working Circle.*—Two felling series were constituted in the Tunacadavu Range as in the earlier plan, to cover the deciduous timber areas not included in the Teak Plantation Working Circle. As in the previous plan, no fellings were prescribed in the Ulandi Felling Series until the close of the first felling cycle of 40

years, as these areas had been heavily exploited between 1931 and 1940. In the Tunacadavu series, the exploitable girth was kept at 1.98 metres. No change was made in the rotation or in the felling cycle. The area of the annual coupe was increased to 102 hectares from 73 hectares in the previous plan in order to cover the entire area within the first felling cycle, the extent of area prescribed in the earlier plan not having been followed properly.

318. *Results.*—The results of working during Bhoja Shetty's working plan period are summarised below :—

319. *The Teak Plantation Working Circle.*—All the areas clearfelled and planted with teak between 1954 and 1956 in the Mount Stuart Felling Series now fall in the Kerala State. The Mount Stuart Felling Series was therefore clubbed with the Ulandi Felling Series and reconstituted as one series, viz., The Ulandi Felling Series. Planting in the Ulandi Valley was commenced in 1957. An area of 34 hectares was clearfelled and planted during this year. The annual rate of conversion was increased to about 80 hectares from 1959 in order to utilise the funds provided under the Five-Year Plan Schemes. The total area clearfelled and planted with teak during the period and the actual yield of timber obtained is given below :—

			Quantity of timber obtained in cubic metres.			
Year of felling.	*Compartment.*	*Area in hectares.*	*Teak.*	*Rosewood.*	*Miscellaneous species.*	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1957–58 ..	Ulandi 81,82 ..	34·00	468·93	23·14	1,267·43	1,759·50
1958–59 ..	Ulandi 82 ..	26·71	537·43	70·79	704·44	1,252·65
1959–60 ..	Ulandi 82, 83 ..	75·27	282·28	60·12	2,061.12	2,404·07
1960–61 ..	Ulandi 82, 83, 85.	119·79	256·83	200·96	5,266·46	5,724·71
1961–62 ..	Ulandi 83, 85, 86	125·86	269·27	123·41	3,686·96	4,079·63
1962–63 ..	Ulandi 83, 85 ..	79·32	259·86	46·02	2,086·50	2,392·37
1963–64 ..	Ulandi 84, 85, 87.	95·51	195·13	120·52	2,798·10	3,113·74

320. The prescription to plant *Eucalyptus robusta* in swamps does not seem to have been carried out. In 1960, an amendment was issued to the working plan which laid down the planting of *Dalbergia latifolia* around the annual teak regeneration area. This prescription too does not seem to have been given effect to. *Eucalyptus citriodora* was planted over a small scale during 1962 in the 1961 plantation. *Eucalyptus grandis* was also planted in 1962 in some of the moist patches in the 1960 plantation where teak had failed. The same species have been planted again in 1963 along the moist stream bed and shows signs of promise although it is too early to draw definite conclusions.

321. The number of weedings prescribed in the working plan for the first year of regeneration proved to be insufficient, as teak in Ulandi is decidedly slower grown than at Mount Stuart and weed competition is greater due to the heavier rainfall prevalent in the region. As many as six weedings are currently being done during the first year combined with uprootal of *Lantana* and bamboos. During the second year, three weedings are done including cutting back of damaged plants, reduction of multiple shoots to one, uprootal of *Lantana* and bamboos. During the third year, two weedings including cutting back of damaged plants, climbers, creepers, and bamboos is being done.

322. The ' elite ' system of thinnings was found in practice to have several disadvantages. Whereas the thinning immediately around the ' elites ' tended to be heavy, the stems in between the plants went unthinned. Considering the fact that the revenue derived from all the thinnings in the life of a plantation is quite considerable, it was a mistake to neglect the rest of the plantation. It was also found in practice, that selection of good stems at the optimum espacement prescribed in the working plan was a problem in plantations of poor quality. The ' elite ' method of thinning was therefore scrapped in 1959, and the old system of thinning was reverted to. The first two thinnings were to be strictly mechanical and the rest silvicultural, but the thinning cycle prescribed in the plan was not kept up.

323. Underplanting of *Evodia* and mahogany as prescribed in the plan was taken up for the first time in 1957; and since then, has been regularly carried out year after year except during 1963. 0.9 metre wide lines were cut at intervals of half a chain and the lines were staked at 3.35 metre intervals. The results of underplanting are not satisfactory. The percentage of survivals is generally poor and the seedlings continue to remain stunted. The details of work done are indicated below :—

Year of under planting. (1)	*Comepartment.* (2)	*Year of teak plantation.* (3)	*Area under planted in hectares.* (4)	*Remarks.* (5)
1957	Mount Stuart 64,65	1928	4·04	
1958	Mount Stuart 71·72	1929	4·04	
1959	Mount Stuart 72,73, 75	1930	4·04	
1962	Mount Stuart 72, 73, 75	1931	4·04	
1963	Mount Stuart 74, 75	1934	4·04	

324. *The Deciduous Selection Working Circle.*—The Tunacadavu Series was worked for 2 years from 1954-55 up to 31st October 1956, when bulk of the areas constituting this series were transferred to Kerala State following 'States Reorganisation'. The areas left over in Mount Stuart Block were not sufficient to constitute a separate series, and hence no further exploitation could be done. The results of actual working as compared with the prescriptions of the working plan are not commented upon, as these areas all lie in Kerala now.

325. Although no selection fellings were prescribed in the Ulandi Felling Series, during 1957, 189 Salmalia trees were enumerated with a view to sell them in the subsequent year. By 1959, 97 trees of 554.75 cubic metres were extracted departmentally and sold at site. Further fellings were stopped as it was not considered desirable to resort to stray sales of standing timber of selected species over an undefined area.

II. *The Punachi Block.*

326. *Arbuthnot's working plan* (1908–1925).—Arbuthnot's working plan for the Punachi Working Circle as it was called, was the first to deal with the deciduous forests of Punachi Block. Arbuthnot prescribed selection fellings of saleable species over 1.83 metres in girth at breast height and removal of unhealthy trees of rosewood and *Pterocarpus marsupium* over 1.37 metres in girth at breast height, subject to a limit for each compartment. Improvement fellings involving removal of inferior species interfering with the growth of valuable species was also prescribed. Artificial aid was to be given to the natural regeneration where necessary.

327. *Results.*—The fellings carried out were excesssive. Between 1908 and 1925, a total of 4,021.79 cubic metres of timber was extracted over an area of 740.57 hectares. The improvement fellings did little good to the forest and the openings only brought in *Lantana* and grass. Between 1916 and 1918, two plots were selected by Hugo Wood and cleared and dibbled with teak, but these failed. Similar work was carried out between 1920 and 1925 over an area of about 26.3 hectares; of this an area of only about 15.38 hectares was successful.

328. *Coode's Working Plan* (1295–1934).—Coode raised the girth limit to 1.83 metres at breast height, but prescribed that no live tree sound or unsound should be felled if its removal would create an undue opening in the canopy. Subject to silvicultural conditions, all exploitable dead, unsound and immature trees were to be felled. Regeneration operations prescribed by him were somewhat on the lines of a shelter-wood system. An area of 147.71 hectares was specified to be treated thus over a period of 15 years. The measures prescribed were :—

(*i*) Evergreen thickets to be felled in December, strewn over the whole area and burnt in February–March.

(*ii*) Thickets of *Lantana* to be burnt every year as late as possible.

(*iii*) Root wounding of rosewood trees after the burn.

(*iv*) Reburning in subsequent years and the removal of the overwood at the discretion of the District Forest Officer.

(*v*) Exclusion of fires after obtaining natural regeneration.

In the rest of the working circle, root wounding of rosewood, climber cutting and burning of *Lantana* thickets alone were prescribed. No artificial regeneration was prescribed to be done anywhere as it was considered too costly.

329. *Results.*—Between 1925 and 1934, an area of 441.51 hectares was worked, the yield being 3,532.1 cubic metres against the estimated yield of 782.96 cubic metres, amounting to nearly 4 times what was estimated by the working plan. The management apparently continued the over-exploitation in the interests of revenue, but to the detriment of the forest as heavy grass and *Lantana* were established on a larger area than previously and possibilities of natural regeneration of valuable species was greatly minimised.

330. *A. N. Sarma's Working Plan.*—(1933–36 to 1940–41)—A. N. Sarma included the Lower Punachi forests under a Plantation Working Circle. An area of 1,057.04 hectares constituted the working circle. In this working plan, prescriptions to artificially regenerate the forests of Punachi Block were made for the first time. The whole area was divided into 2 periodic blocks. A block of 91.05 hectares with area considered suitable for planting was set apart as P.B.I. Artificial regeneration was prescribed at an annual rate of 10 hectares. Stump planting of teak was prescribed as the main species for planting after clearfelling at an espacement of 1.83 metres by 1.83 meters, but rosewood and *Pterocarpus marsupium* were to be introduced either by planting stumps in quiacunx in between alternate rows of teak, or by dibbling seed in prepared patches close to teak stumps or by whatever method the District Forest Officer might consider likely to be successful. The planting was prescribed to be done in conjunction with *kumri* utilising the hill tribes of Lower Punachi. The rest of the area of 965.99 hectares was designated as P.B. II. Subsidiary fellings were prescribed in this area, but these were referred to in the working plan as ' selection fellings '.

331. *Results.*—An area of 49.78 hectares was actually clearfelled and planted between 1936 and 1940. Subsidiary fellings done between 1935–36 and 1938–39, yielded 332.47 cubic metres of teak, 162.82 cubic metres of *Pterocarpus marsupium* and 113.47 cubic metres of rosewood resulting in further over exploitation of these forests.

332. *T. V. Venkateswara Ayyar's Working Plan* (1941-42 *to* 1953-54).—The Lower Punachi forests were included as a separate series known as the Punachi Felling Series in Venkateswara Ayyar's Conversion Working Circle. The total area of this series was 688.78 hectares and consisted of plantations raised during Sarma's plan and such of those areas considered fit for further planting. The felling series was divided into 2 periodic blocks—An area of 90.65 hectares was classified as P.B.I. This included an area of 49.86 hectares of plantations raised in the past. The rest of the area was classified as P.B. II. No subsidiary fellings were prescribed as the forests had " been subjected to systematic over-exploitation in the past in the name of selection fellings " (T. V. Venkateswara Ayyar). The annual area for clearfelling was kept at 10 hectares as before, but dibbling of sandal was suggested for introduction with the teak as a subsidiary species, not much return being expected of the teak itself. The same thinning intensity and regime as prescribed for the Mount Stuart Felling Series were also prescribed for these plantations.

333. *Results.*—Between 1941 and 1942, a further 123.23 hectares were clearfelled and planted under the prescriptions of this plan. The results of regeneration were however disappointing. Out of a total of 189.79 hectares planted till 1952, only 106.72 hectares were reasonably stocked. Further planting was therefore given up. Sandal has established itself in portions, but heartwood formation is very little. The thinnings prescribed in the working plan were frequently postponed because of the poor quality of the plantations formed.

334. *K. A. Bhoja Shetty's Working Plan* (1954–55 *to date*).—Bhoja Shetty did not prescribe any planting of teak at Lower Punachi as the results of past work were not very encouraging.

335 Bhoja Shetty prescribed the 'elite' system of thinnings for the Punachi Series also, but since these plantations were distinctly inferior to those of Tunacadavu Range, the thinnings were prescribed to be done once in 10 years.

336. *Results.*—Notwithstanding prescriptions to the contrary, teak planting was resumed at Lower Punachi from 1957 onwards at 20 hectares per annum utilising the funds provided under the 2nd and 3rd Five-Year Plan Schemes. An area of 411.16 hectares was raised under these schemes with teak between 1957 and 1963. The plantations raised since 1957 are in no way more encouraging than those of the past.

337. The 'elite' system of thinning was abolished in 1959, and the usual system was reverted to, but the thinnings were deferred or postponed frequently due to the poor growth.

III. *The Villoni Valley.*

338. *T. V. Venkateswara Ayyar's Working Plan* (1941–42 *to* 1953–54).—T. V. Venkateswara Ayyar was the first to deal with the exploitation of the deciduous timber forests in the Villoni Valley of Pollachi Range. Venkateswara Ayyar included a block of 202.3 hectares of deciduous timber forests in the valley as a separate felling series, viz: the Villoni Felling Series in his Deciduous Selection Working Circle. An enumeration of all saleable trees above a breast height girth of 1.5 metres in the valley had been made in 1930 by the Range Officer, Pollachi. This enumeration list was traced out and the volume of all teak, rosewood and miscellaneous species above a breast height girth of 1.83 metres over bark calculated with reference to the local volume tables for Lower Punachi. The exploitable girth was however kept at 1.83 metres at breast height. A rotation of 160 years and a felling cycle of 40 years was adopted for this series as for the Tunacadavu Selection forests, but the total area of the series being small, the entire area was proposed to be exploited in two successive years and the series given rest for the next 38 years.

339. *Results.*—The entire area of the felling series was worked during the years 1941 to 1943. 781.99 cubic metres of teak, 323.94 cubic metres of rosewood and 172.05 cubic metres of miscellaneous species in all amounting into 1,277.99 cubic metres of timber was extracted as against a forecast of 736.24 cubic metres made in the working plan.

340. *K. A. Bhoja Shetty's Working Plan* (1954–55 *to date*).—Bhoja Shetty included the Villoni Felling Series as a separate series in his Deciduous Selection Working Circle. No fellings were however prescribed, as exploitation for the entire felling cycle of 40 years commencing from 1941 was completed by 1943. The area is due for working only in 1981.

B. EVERGREEN FORESTS.

341. The earliest attempts to market timber from the evergreen forests were during 1903 to 1905. Felling of timber was undertaken in Andiparai shola in the Punachi Range, the timber carted departmentally to Anamalai village as an attempt was made to sell it there. The quantity recorded as felled was as follows :—

Species. (1)	*Quantity in cubic metres.* (2)
Mesua ferrea	416·85
Calophyllum elatum	204·93
Drysoxylum malabaricum ..	102·25
Artocarpus heterophyllus ..	23·45
Cedrela toona	31·46

342. **Mesua** was mainly felled in the form of young poles for pit props for supply to the Kolar mines. The operations were a failure ending in loss to the Government and were consequently abandoned.

343. Between the years 1925 and 1929, the Logging Engineering Division 'cruised' the Kallar Valley carrying out valuation surveys and preparing topographical maps for part of the valley, with a view to carry out intensive exploitation of timber from the area. "However, the survey valuations and maps were found to be unreliable, as estimation had been carried too far, being extended in some cases, even to the names of species" (A. N. Sarma). A similar topographical survey and 50 per cent enumeration of the Karianshola forest in Tunacadavu Range is also said to have been done at the same time.

344. The clearing of shola forests in the Kallar Valley for planting of cinchona drew attention to the possibility of utilisation of timber and accordingly in 1926–27, as an experimental measure 6,000 Broad Guage sleepers were extracted and supplied to the Railways at Pollachi by the Logging Engineer. The operation was a success and was therefore extended up to 1933. A total of 79,298 Broad Guage sleepers and 18,271 Narrow Guage sleepers were extracted and supplied to the Railways during the 7 years period from 1,740.15 hectares of land in the Kallar Valley that was handed over to the Cinchona Department in 1934. In addition to the extraction of railway sleepers, timber from *Palaquium ellipticum* (38.71 cubic metres), *Calophyllum elatum* (4.53 cubic metres), *Cedrela toona* (181.26 cubic metres) and *Dysoxylum malabaricum* (8.47 cubic metres) were also felled on a small scale and sold in the market.

345. ***Wood's Working Plan.*—(1919–20 *to* 1930–31).—For the Mount Stuart** forests included 1,477.91 hectares of evergreen forest in Karianshola under a separate working circle—the Karianshola Working Circle, but did not prescribe any exploitation in the area, in order to maintain the evergreen character of the forest in the interests of the many streams which had their source in it.

346. *M. V. Laurie's Working Plan* (1931–32 *to* 1940–41).—Laurie's working plan for Mount Stuart included 833.65 hectares in Karianshola under a separate Karianshola Working Circle. As the market for evergreen timber was uncertain in those days, light selection fellings were prescribed to be done departmentally, the girth limits being **1.83 metres for *Mesua*, 2.13** metres for *Hopea*, 2.74 metres for *Calophyllum*, and 2.43 metres for all other saleable species. The rotation was fixed arbitrarily at 150 years and the felling cycle at 25 years. The annual coupe was fixed as 33.35 hectares, it being laid down that not more than 7 trees per hectare be extracted. Gaps caused by felling were to be regenerated at an espacement of 1.22 metres by 1.22 metres with seeds, seedlings or stumps of *Hopea*, *Artocarpus hirsuta*, *Acrocarpus*, *Mesua*, *Dysoxylum and Cedrela*. Existing natural regeneration of *Hopea* was to be tended.

347. ***Results.*—No exploitation** of the Karianshola forests was carried out until 1939, due to a glut in the timber market. In 1939 and 1940, a coupe was put up for sale but there were no purchasers. Since no fellings were executed, gap regeneration couldn't be done. *Hopea* regeneration was tended from 1933 to 1937, after which it was given up under orders of the Chief Conservator of Forests.

348. *A. N. Sarma's Working Plan* (1935–36 *to* 1940–41).—A. N. Sarma constituted a Selection Working Circle which included 1,976.89 hectares of evergreen forests in the Kallar Valley which was set apart by Government for raising Cinchona plantations, but these were not expected to be formed in the near future. The entire area was constituted into one felling series—the Kallar Felling Series. A 33 per cent enumeration by the method of systematic strip sampling was carried out over the area. An exploitable girth of 2.13 metres was fixed and selection fellings were prescribed to be carried out through the agency of contractors. *Mesua* for railway sleepers was then the only species which could be exploited at a profit with certainty, but other species could be exploited if saleable at a profit. In the absence of any data regarding the growth rate of *Mesua*, no rotation was fixed, but a felling cycle of 10 years was adopted.

Gaps not containing valuable advance growth were prescribed to be regenerated artificially with valuable species such as *Acrocarpus fraxinifolius*, *Cedrela toona*, *Dysoxylum malabaricum*, *Dipterocarpus bourdilloni* and *Gluta travancorica* at an espacement of 1.83 metres by 1.83 metres.

349. *Results.*—Coupes I to V were worked regularly between 1935-36 to 1939-40 for sleepers, some Red Cedar scantlings also being extracted for the cigar box industry. Charcoal was manufactured from rejections and top ends of *Mesua* in 1939-40, but the operation resulted in a loss.

350. In 1939-40, the Government suddenly decided to expand Cinchona planting in the Kallar valley. Coupes I to V already worked for *Mesua* sleepers under the selection system were therefore exploited once again in 1940-41, this time for all available *Mesua* sleepers irrespective of any girth limit, and then handed over to the Cinchona Department for clearfelling and planting.

351. The out-turn of railway sleepers from Coupes I to V is compared with the working plan estimate in the subjoined statement.

Coupe.	*Sleeper yield in Broad Gauge Units.*	
	Estimated.	*Actuals.*
(1)	(2)	(3)
I	11,541	8 915
II	11,498	10,627
III	11,957	14,270
IV	11,736	11,960
V	12,864	10,027

352. Gap regeneration was carried out until 1938-39 with little success and was therefore given up later.

353. *T. V. Venkateswara Ayyar's Working Plan* (1941-42 *to* 1953-54).—Venkateswara Ayyar brought the exploitable evergreen forests of the entire division under an Evergreen Selection Working Circle to distinguish them from his Deciduous Selection Working Circle. His Evergreen Selection Working Circle was composed of Laurie's Karianshola Working Circle and Sarma's Selection Working Circle. Two felling series were constituted—(*i*) The Karianshola Felling Series in the Tunacadavu Range with an area of 833.65 hectares, and

(*ii*) The Kallar Felling Series in the Punachi Range extending over 1,976.89 hectares as in the previous plans.

354. In the Karianshola Felling Series, the prescriptions were essentially the same as in Laurie's working plan. Artificial regeneration under the top canopy was to be experimented over 2 to 4 hectares every year in combination with cardamoms.

355. In the Kallar Felling Series, Sarma's prescriptions were continued and coupes VII to X of his plan were prescribed to be worked during the balance period of the felling cycle.

356. *Results.*—Owing to heavy demands during the war, the entire Karianshola Felling Series was exploited between 1941-42 and 1943-44 with the following results :—

Year.	*Estimated yield.*	*Actual yield.*	
	Cubic metres.	*Cubic metres.*	*Broad Gauge units.*
(1)	(2)	(3)	(4)
1941-42	854·50	750·42	3.261
1942-43	854·50	18·92	2,808
1943-44	854·50	166·81	..

The disappointing yield as compared with the forecast was mainly due to the fact that only a few of the species as enumerated as saleable actually found a lucrative market.

357. In the Kallar Felling Series, coupes VII to X were worked between 1941–42 and 1947–48, the yield being as follows :—

Year of working. 1)				Coupe. (2)	*Estimated yield.* Cubic metres. (3)	*Actual yield* Cubic metres. (4)
1941–42 1942–43	..	..	..	VII	1,041·58	1,100·14
1945–46 1943–44 1944–45	..	..	..	VIII	1,017·28	579·39
1943–44 1944–45 1945–46	..	..	..	IX	1,100·11	1,158·21
1942–43 to 1947–48	..	..	..	X	1,241·98	2,576·94

358. The whole area was then handed over to the Cinchona Department who exploited it on a seigniorage basis, the revenue realised being credited to that department.

359. *Bhoja Shetty's Working Plan* (1954-55 *to date*).—Bhoja Shetty retained the Evergreen Selection Working Circle with its two felling series as in the previous plan. The Kallar Felling Series was substituted by the Punachi Felling Series, as bulk of the Kallar Valley had been already handed over to the Cinchona Department. No fellings were prescribed in the Karianshola Felling Series as the entire area had been worked between 1941–42 to 1943–44. It was also decided to give rest to this forest as it primarily served as a protective forest. the water supply to Topslip colony being dependant on it.

360. The Punachi Felling Series comprised of two blocks of forests; one block of 807.35 hectares adjoining Sheikalmudi and Savalmalai in the Tunacadavu Range, and the other block of 757.58 hectares in the Kallar and Italiar Valleys west of the region handed over to the Cinchona Department. A 10 per cent enumeration of the growing stock was carried out by the method of "systematic strip sampling". Light selection fellings of mature and over-mature trees of saleable species over an exploitable girth of 2.13 metres was prescribed, subject to a maximum of not more than 15 trees per hectare. A rotation of 150 years was estimated as required by most of the species to attain a girth of 2.13 metres. The felling cycle was fixed at 30 years. An average annual yield of 1,576.43 cubic metres was estimated from the enumeration figures that were compiled, but coupes of equal area were marked on the maps.

361. Regeneration measures such as controlled thinning of the canopies with under-planting of desirable species such as *Artocarpus hirsuta*, *Dipterocarpus indicus* and *Acrocarpus fraxinifolius* and progressive opening of the canopy upwards to keep pace with the development of the introduced plants by girdling or poisoning the trees to be removed were prescribed to be done on experimental lines at the discretion of the local staff.

362. *Results.*—The Punachi Felling Series was heavily exploited in order to make for the targeted supply of sleepers promised to be supplied to the Railway annually. Neither the area nor the sequence prescribed in the working plan seems to have been followed. The exploitation for sleepers was done entirely through the agency of contractors until 1960-61 and lop and top ends remaining in the coupes were sold in auction in the year subsequent to sleeper working. Until 1957-58, *Mesua and Calophyllum* alone were exploited for sleepers. From 1958-59, *Canarium strictum*, *Cullenia rosayroana* and *Palaquium ellipticum* were also accepted by the railways. Several of the coupes worked prior to 1957-58 were therefore gone over again to pick out sleepers of these species and make up the target of supply.

Year of working.	*Coupes worked.*	*Species exploited.*	*Total volume of timber felled in cubic metres.*	*Number of sleepers obtained.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)
1954–55	I, II and III (Part).	*Mesua ferrea* *Calophyllum elatum.*	2,098·61	7,901 2,725	Broad Guage. Metre Guage.
1955–56	III (Part), IV and V.	*Mesua ferrea* ..	1,073·55	3,871 1,736	Broad Guage. Metre Gauge.
1956–57	VI and VII ..	*Mesua ferrea* ..	141·02	376 345 225	Broad Guage. Metre Guage. Narrow Guage.
1956–57	III (Part), IV and V.	*Calophyllum elatum*	1,167·22	2,832 4,638	Broad Guage. Metre Guage.
1957–58	III, IV, V, VI and VII.	*Mesua ferrea, Calophyllnm elatum.*	2,497·99	7,374 5.161 3,219	Broad Guage. Metre Guage. Narrow Guage.
1958–59	VIII and IX.	*Mesua ferrea*	1,095·58	2,381 3,418 2,261	Broad Guage Metre Guage. Narrow Guage.
1958–59	I, II, III (Part), VII and IX.	*Calophyllum elatum, Cullenia rosayroana, Canarium strictum.*	593·52	2,345 363 276	Broad Guage, Metre Guage. Narrow Guage.
1959–60	X, XI, XII and XIII.	*Mesua ferrea.*	870·00	4,709 2,681 1,375	Broad Guage. Metre Guage. Narrow Guage.
1959–60	III (Part), IV, V, V, VI and II.	*Palaquium ellipticum, Calophyllum elatum, Cullenia rosayroana, Canarium strictum.*	801·54	9,028 3,060 3,076	Broad Guage. Metre Guage. Narrow Guage.
1960–61	X, XI, XII, XIII, XIV, XV and XVI.	*Mesua ferrea, Calophyllnm elatum, Cullenia rosayroana, Canarium strictum.*	5,734·97	14,872 5,357 3,983	Broad Guage. Metre Guage. Narrow Guage.
1961–62	..	*Nil.*	..	..	..

364. In 1957, the Conservator of Forests (K. A. Bhoja Shetty) made the following comments in the inspection notes of the division which are worth mention here—"It is inadvisable to go over the same area year after year for exploitation. Firstly fellings cause a lot of damage to seedlings, saplings and poles, and therefore it is preferable to complete exploitation in a coupe within a year instead of repeating fellings in the same coupe year after year. Secondly, exploitation from the same area year after year will reduce the period of the felling cycle. Therefore, at least in future the practice of going over the same coupe year after year should be stopped. All the utilisable species in each coupe may be extracted in one year, subject to the marking rules laid down in the working plan."

365. But the system of working was in no way changed and the heavy exploitation continued. The following extracts from the inspection notes of the Conservator of Forests (K. Andiappan) made in 1963 are reproduced here. "There has been over-exploitation and excessive removal of trees in the Ulandi coupes of Punachi Felling Series while working for railway sleepers. Apart from heavy openings in the evergreen areas, there was enormous wastage of timber in the process of production of sleepers". From coupes X to XVI, "out of 5,734.97 cubic metres of converted log volume, only 1,797.07 cubic metres of sleepers were produced, the remaining quantity having been left as porotes and wastage for sale subsequently. Invariably the sleeper contractors themselves were taking the top ends also in the subsequent years. So much so, while working for sleepers, the sleeper contractor was tempted to cause inexplicable damage to the adjoining unmarked trees and also cause terrible wastage in conversion in order to swell up the quantity of top ends which he could remove as a separate lease subsequently. Further windfallen sound trees of sleeper species were not converted into sleepers at all but left behind to form top ends. The explanation was that the contract was for felling and converting only marked trees. Thus the whole system required complete reorientation in the interests of preservation of evergreen forests and to prevent wastage and loss to Government".

366. According to the new system which was given effect to from 1962–63, the marked trees are felled, converted into suitable sleeper lengths, measured and dragged to roadside depots departmentally for supply to the contractor. The conversion of logs into sleepers, transport to Pollachi, fixing clamps, spreading for passing and loading into railway wagons are given on contract. The rejected sleepers at the rail-head depot are the property of Government and the contractor is entitled only to the porotes and sawn wastages obtained by converting the sleepers. The wastages and top ends obtained are converted departmentally into firewood and sold.

367. Under the new system, the cost of extraction of one Broad Gauge unit works out to Rs. 11.67 and the quantity of timber utilised to 0.19 cubic metres as against 0.42 to 0.56 cubic metres utilised under the previous system. The new system was definitely a little more advantageous to Government as wastage of timber was much less, but the damage caused to adjacent trees while felling and windfalls subsequent to felling continued to be heavy. Although the marking was very conservative, the damage caused to other trees in the course of felling often tended to exaggerate the fellings and make them appear rather excessive. The margin of profit by the new method works out to Rs. 5.33 per Broad Gauge unit which although slightly more than what was obtained by the previous system, brought in a royalty of Rs. 0.82 per cubic foot which is barely equal to the seigniorage fees.

368. During 1962–63, wind fallen trees of sleeper species and a portion of the area outside the working circle were also worked, but entirely departmentally, and transported to Pollachi on contract. By this method, the cost of production of one Broad Guage unit works out to Rs. 10.81, thereby increasing the margin of profit to Rs. 6.19.

369. The following statement gives details of the areas exploited during 1962-63 :—

Year of working.	*Coupes worked.*	*Species exploited.*	*Total volume of timber felled in cubic metres.*	*Number of sleepers obtained.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)
1962–63	XVII and XVIII.	*Mesua ferrea, Poeciloneuron indicum.*	3,864·47	16,918 Broad Guage. 4,896 Metre Guage. 1,595 Narrow Guage.	Felling and dragging done departmentally.
1962-63	XVII and XVIII and a small area outside the working circle.	*Mesua ferrea, Poeciloneuron indicum, Cullenia rosayrcana.*	916·22	6,570 Broad Guage. 589 Metre Guage. 616 Narrow Guage. 514 Specials	Departmental exploitation.

370. The regeneration measures prescribed in the working plan have not been carried out.

C. FUEL FORESTS.

371. The earliest sanctioned working plan for the tract was prepared by Gass in 1896 for the Ayerangal Fuel Working Circle of 323.75 hectares, to be worked on the 'coppice with standards' system on a rotation of 20 years. Not less than 62 standards per hectare were to be retained and the coupe was to be worked departmentally. Although artificial regeneration was not prescribed, cleanings of climbers and weeds for two years following the fellings were prescribed to be done. This working plan was followed for the whole rotation.

372. In 1902, Foulkes prepared a working plan for the rest of the outer slopes of the Pollachi Range, treating Gass's working plan as a part of his working plan. This plan constituted the Kottur Fuel Working Circle, an area of 1,133.12 hectares to be worked on the coppice with standards' system on a rotation of 20 years. Up to 100 standards per hectare were to be retained. The working plan constituted also a Timber Working Circle, a Western Closed Working Circle and an Eastern Closed Working Circle —all to be protected.

373. In 1902, another working plan for the Udumalpet Range was also prepared by Foulkes constituting the following Fuel Working Circles :—

	Area in hectares
The Amaravathi Valley Working Circle	2,067.14
The Kamanuthu Valley Working Circle	2,465.35
The Dhali Working Circle	1,296.21

374. A 'coppice with standards' rotation of 15 years was prescribed. Planting of timber species to serve as standards were prescribed as there were no suitable ones in the forest. Sowing of seeds of manure leaf yielding species and palmyra was also to be done. Though this working plan was not sanctioned as such, a summary of its prescriptions was approved and given effect to. In actual working, by about 1918, the fellings were very much in arrears as the annual coupes varied from 60 to 290 hectares in extent and labour was difficult to procure.

375. In 1919, the working plan was revised by Habibullah reconstituting the three fuel series—Amaravathi, Kamanuthu and Dhali over an area of 3,054.97 hectares. Habibullah also changed the system of working to 'simple coppice' on a 35 year rotation. Cleanings and prickly pear removal were prescribed following the year of felling. The revised plan was worked up to 1934.

376. In course of time, the demand for fuel increased in the market and two new series—Gudaravalli and Pachathanni in the 'Western Closed Working Circle' were opened in 1907 and 1911 respectively. This informal working continued until 1920, when E. M. Crothers prepared a 'Summary of prescriptions' for the Pollachi Range with 5 fuel series —Pothamadai, Gudaravalli, Ayerangal, Pachathanni and Kottur to be worked from 1921-22. Here too, the system of working was changed to 'simple coppice' and the rotation increased to 35 years. In 1923, these prescriptions were embodied in a regular working plan prepared for the Pollachi Range by W. G. Dyson. In 1932, as a deviation to this working plan, two further fuel felling series, Keerapadi and Nallar were added to the Fuel Working Circle, increasing its area to 2,838.06 hectares. Dyson's working plan continued until 1935.

377. *A. N. Sarma's Working Plan* (1935-36 *to* 1940-41).—A. N. Sarma's working plan comprised of a Clearfelling Fuel Working Circle to regulate fuel working in the division. The working circle covered an area of 8,093.72 hectares on the outer slopes of Pollachi and Udumalpet Ranges. Twelve felling series were constituted in all of which seven—Pothamadai, Keerapadi, Gudaravalli, Ayerangal, Pachathanni, Kottur and Nallar were in Pollachi Range, and five—Dhali, Kamanuthu, Chinnar, Amaravathi and Navalodai were in Udumalpet Range. The 'simple coppice' system was prescribed with a rotation of 30 years for the 5 western most felling series which receive comparatively greater annual rainfall, and 40 years for the remaining 7 felling series. Natural regeneration by coppice was to be supplemented by 'rab' regeneration in strips with sowing of seeds of indigenous fuel species. It was suggested that regeneration by *kumari* may be tried experimentally.

378. *Results.*—Between 1936 and 1939, the demand for fuel was slack in the Udumalpet Range owing to famine conditions prevailing locally, and the electrification of several cotton mills which formerly used fuel for their power production. The Dhali reserve (258.91 hectares) and 264.26 hectares in the Anamalai Reserved Forest were disreserved during the same period. Some of the series had to be therefore reconstituted in the Pollachi Range, the coupes were almost regularly sold.

379 *Kumri* regeneration of fuel coupes in the division was first started in 1935 in the Ayerangal Felling Series. A considerable degree of success was attained so that the coupes in this series were regenerated year after year in the same manner. The system was extended to the Nallar Series in 1937, to Kamanuthu and Pothamadai in 1938, and to Keerapadi and Kottur in 1930. The demand for *kumri* became so keen,

that in 1940, coupes in Ayerangal, Keerapadi and Pothamadai series were leased out for rents. The *kumri* lines were kept 12.19 metres apart to start with, but later reduced to 6.10 metres. Cotton and *ragi* were the field crops generally raised. In the remaining series where the soil and rainfall condition are very poor, ' rab ' sowings were done over the first one or two strips of the coupes of the year in the north-east monsoon of the year of felling, and over the remaining strips in the south-west monsoon, following the completion of felling. The results were however not as successful as obtained in the series in which *kumri* was done. In either case, the species raised where of indigenous fuel species, species of *Acacia* in paritcular predominating.

380. *T. V. Venkateswara Ayyar's Working Plan* (1941–42 *to* 1953–54).—T. V. Venkateswara Ayyar constituted a Fuel Working Circle of 8,407.35 hectares divided into 12 felling series as in the previous plan. The rotation and silvicultural system remained unaltered, but tamarind and soapnut occurring inside the coupes were prescribed not to be felled unless they had ceased to bear. Natural coppice regenaration was to be supplemented by artificial regeneration by *kumri* with indigenous fuel species and teak.

381. *Results.*—The demand for fuel in the Pollachi Range was keen and the coupes were worked satisfactorily. Besides the coupes prescribed for working additional areas outside the Fuel Working Circle were worked between 1942–43 and 1945–46 to meet the war demand for fuel and charcoal for motor transport owing to the scarcity of petrol.

382. During 1949–50 and 1950–51, the sales of fuel coupes in the Pollachi Range was ordered to be held in abeyance in G.O. Ms. No. 5173, Development, dated 5th October 1949, since very large areas of evergreen forest were being converted into Cinchona plantations and it was considered that fuel from these forests would more than amply meet the local demand. The sale of fuel coupes in this range was again resumed in 1951–52. In the Udumalpet Range, owing to lack of demand and poverty of the stand, the sequence prescribed in the working plan was generally not followed properly.

383. There was a keen demand for *kumri* cultivation in most of the fuel series of Pollachi Range and where it was allowed the results were extremely encouraging. Indigenous fuel species like *Acacia arabica* *Acacia ferruginea*, *Acacia planifrons*, Neem, Tamarind *Prosopis julieflora* and some teak seems to have been mainly raised. In the Udumalpet Range, very little regeneration seems to have been done due to lack of demand for *kumri* on account of poor soil and rainfall conditions.

384. *Bhoja Shetty's Working Plan* (1954–55 *to date*).—The prescriptions of this working plan were essentially the same as in Venkateswara Ayyar's plan. The total area of the Fuel Working Circle was 8,410.59 hectares. The 12 felling series were retained with a few changes. The rotation and silvicultural system were left unaltered. Artificial regeneration with *kumri* was prescribed to supplement the natural coppice as in the previous plan, but in addition to the species prescribed by Venkateswara Ayyar. *Dalbergia latifolia* and exotics like *Dalbergia sissoo*, *Eucalyptus rostrata* and *Eucalyptus* hybrid were also suggested.

385. *Results.*—The Fuel Working Circle underwent a series of changes during the working plan period. To start with, on account of the Amaravathi Project, 368.87 hectares in the Amaravathi Series and 391.33 hectares in the Kamanuthu Series got submerged in 1957. The submergible areas were exploited during the years 1955–56 and 1956–57. Since large areas were clearfelled during these two years, none of the coupes belonging to any of the series in the Udumalpet Range were sold. Most of the earlier coupes in the Amaravathi Felling Series having been submerged, further working in this series was suspended pending revision of the working plan and reconstitution of the whole series. In the Kamanuthu Felling Series, only the later coupes were affected and the series were therefore continued. From 1957–58 onwards, excepting for the Amaravathi Felling Series, all the other series in the Udumalpet Range were regularly worked following the sequence prescribed in the working plan.

386. In the Pollachi Range, the Keerapadi Felling Series was transferred to Kerala State on 1st November 1956, following 'States Reorganisation'. In working the remaining series, the table of fellings prescribed in the working plan was not adhered to, as several additional coupes were worked in some of the years and artificially regenerated in order to utilise the funds provided under the Five-Year Plan Schemes. In working additional areas even the sequence prescribed in the plan has not been followed. Details regarding the coupes worked during the working plan period under each of the felling series are already given in paragraph 199 of Chapter III.

387. With the advent of the Parambikulam-Aliyar Project in 1958, there was further diminution in the area of the Fuel Working Circle. The Aliyar Dam which was completed in 1963, resulted in deforestation of 158.23 hectares in the Kottur Felling Series The growth in the submergible areas was clearfelled and disposed off during 1961–62 and 1962–63. Besides this, at several places east of the Vagiriar right up to the Ponnalamman shola, vegetation in portions immediately lying below the Parambikulam–Aliyar Project contour canal has been destroyed by the heaping of blasted stone and debris obtained in excavating the canal. Deforestation of areas of smaller extent had also to be done at several other places for construction of roads, offices and residential colonies of the Public Works Department and the Electricity Board. The growth obtained in clearing these areas has been disposed off then and there. The Thirumurthi Dam which is under construction at the time of writing this plan, is also expected to involve submergence of a small area in the Dhali Felling Series adjoining the Tirumurthi temple. Details regarding this are expected to be known only later as the areas are yet to be surveyed at the time of writing this plan.

388. Regeneration of all the felled coupes in the Pollachi Range except the Nallar Felling Series was undertaken in conjunction with *kumri*. There was a keen demand for kumri cultivation in all the seriesexcepting Nallar where the terrain and soil are generally unsuitable for the cultivation of agricultural crops. Most of the coupes were sold along with the right to do *kumri* cultivation for a period of 3 years after the felling. This condition was introduced because there was not much demand for coupes in some of the series, as th ecoppice regrowth was poor and it was felt that the additional right to do *kumri* cultivation in the area would bring in more competition. *Ragi* and cotton were the crops generally cultivated. The Pollachi Range is blessed with both the monsoons. The planting of the forest crop is done during the south-west monsoon following the year of felling as this has been found in practice to be the best, but the lessee invariably harvests a crop of *ragi* or grass in the first 2 strips of the coupe during the first winter itself. The plantations raised vary from essentially fuel species such as Neem. Tamarind. *Acacia arabica* and *Eucalyptus* hybrid of the Chickballapur variety to timber species such as Teak, *Dalbergia latifolia*, *Dalbergia sissoo*, *Terminalia tomentosa*, and *Pterocarpus marsupium* and even soft woods such as *Ailanthus excelsa* and *Salmalia malabarica*.

389. The following statement gives details of the areas planted with various species in the Pollachi Range.

Year of planting. (1)	*Species planted.* (2)	*Area in hectares.* (3)	**Remarks.** (4)
1954	*Ailanthus excelsa*	8·09	—
1954	*Salmalia malabarica*	2·43	—
1954	Miscellaneous fuel and hardwood species (mixed).	66·37	—
1955	*Ailanthus excelsa* and *Salmalia malaborica* (mixed):	11·17	—
1955	Miscellaneous fuel and hardwood species (mixed).	42·90	—
1956	Miscellaneous fuel and hardwood species (mixed).	53·82	—
1956	*Ailanthus excelsa* and *Salmalia malabarica* (mixed).	21·85	—
1957	Miscellaneous fuel and hardwood species (mixed).	37·23	—
1957	*Ailanthus excelsa* and *Salmalia malabarica* (mixed).	18·62	—

Year of planting. (1)	Species planted. (2)	Area in hectares. (3)	Remarks. (4)
1958	Miscellaneous fuel and hardwood species, and *Eucalyptus* hybrid (mixed).	47·75	..
1958	*Ailanthus excelsa* and *Salmalia malabarica* (mixed).	7·28	
1959	Miscellaneous fuel and hardwood species, and *Eucalyptus* hybrid (mixed).	44·52	
1959	*Ailanthus excelsa* and *Salmalia malabarica* (mixed).	21·04	
1960	*Ailanthus excelsa* and *Salmalia malabarica* (mixed).	23·47	..
1960	*Eucalyptus* hybrid	142·05	..
1961	*Ailanthus excelsa* and *Salmalia malabarica* (mixed).	14·97	..
1961	Miscellaneous fuel and hardwood species (mixed).	116·55	..
1962	*Ailanthus excelsa* and *Salmalia malabarica* (mixed).	12·14	..
1962	Miscellaneous fuel and hardwood species, and *Eucalyptus* hybrid (mixed).	38·04	..
1963	Miscellaneous fuel and hardwood species, and *Eucalyptus* hybrid (mixed).	72·03	..

390. In the softwood plantations raised, to start with in 1954, *Ailanthus excelsa* and *Salmalia malabarica* were planted pure in portions of the felled coupe, but from 1955 onwards the two species were planted in alternate pits to form an intimate mixture. From 1958, *Salmalia* was raised pure. Both transplants and container (pot or polythene) plants have been used for planting. To start with, the espacement adopted varied from 3.66 metres by 3.66 metres for *Ailanthus* to 5.18 metres by 5.18 metres for *Salmalia*. In 1958, an espacement of 4.57 metres by 3.65 metres was adopted for the mixed plantation. In 1956, this was changed to 5.18 metres by 5.18 metres. From 1957, an espacement of 4.57 metres by 4.57 metres was adopted as the standard. The plantations raised are generally good, but some of the plantations of the Pachathanni Felling Series are comparatively poor as the soil here is shallow and rocky. In the latter plantations, *Eucalyptus* hybrid was therefore put in quincunx during 1962. Planting of softwood in the Pollachi Range was discontinued from 1962.

391. The miscellaneous fuel and hardwood plantations raised are a great success throughout the range. The plantations raised are all intimate mixtures of several species. The species chosen vary from Neem, Tamarind, *Acacia arabica* and *Dalbergia sissoo* raised in the earlier plantations to teak, *Dalbergia latifolia*, *Terminalia tomentosa* and *Pterocarpus marsupium* in the later plantations. The timber species raised were expected to yield good quantity of small timber in addition to firewood, but the choice of mixing *Dalbergia latifolia* with these species is however not understood, as these forests are to be worked on a rotation of 30 years when one can hardly expect any timber out of this species. The plantations were raised essentially by sowing in lines 6.71 metres apart. Wherever there were blanks or failures in the hardwood areas, *Eucalyptus* hybrid container plants were planted in 1962. The *Eucalyptus* hybrid has invariably come up very well in these gaps.

392. Regular planting of the Chickballapur *Eucalyptus* hybrid was started in the Pollachi Range in 1958 on a small scale of 6.48 hectares in one of the felled coupes of the Gudaravalli Felling Series. As the plantation proved to be extremely successful, further planting was continued on a large scale. The espacement adopted was 4.57 metres by 4.57 metres to start with, but as the plants grow fast, straight and tall with a thin branchless candle like canopy which does not close, it was decided to plant at a closer espacement later on. An espacement of 3.35 metres by 3.35 metres was accordingly adopted since 1961. In the plantations raised after 1960, in addition to the existing plants of *Eucalyptus* hybrid, stump planting of teak and sowings of *Pterocarpus marsupium* and *Dalbergia latifolia* were also done in lines between the *Eucalyptus* rows a year or two later. During 1963, after planting *Eucalyptus* hybrid at an espacement of 3.35 metres by 3.35 metres, sowing of miscellaneous hardwood species was done the same year itself in the alternate lines in between the *Eucalyptus* rows. In either case, although there has been good germination, the miscellaneous species have been overshadowed by the much faster grown *Eucalyptus* hybrid and these areas appear

essentially like *Eucalyptus* hybrid plantations. *Eucalyptus* hybrid seeds were initially obtained from the Mysore Forest Department, but since 1962, seeds collected from the local plantations are being used. The local seeds are found to give a better germination percentage and even 60 grams of seed per bed has been found to be quite sufficient to ensure adequate germination.

393. In the Udumalpet Range, regular planting of felled coupes could not be done due to want of sustained demand for *kumari*. However, softwoods such as *Ailanthus excelsa* (*mostly*) with some *Salmalia* were raised between 1957 and 1960 in the Navalodai and Kamanuthu Felling Series at an espacement of 4.57 metres by 4.57 metres in conjunction with *kumri*. Cotton was the field crop raised. The planting was done in the north-east monsoon, as south-west showers are not felt in the range. The growth of softwoods in these plantations is poor. Further planting of softwoods was therefore given up with effect from 1961. From the same year, miscellaneous fuel species such as Tamarind, Neem, *Acacia leucophloea* and *Eucalyptus* hybrid have been planted in the Kamanuthu, Navalodai and Chinnar Felling Series with or without *kumri*, including replacement of some of the failed softwood areas. Wherever there was a demand for *kumri*, sowing of seeds of miscellaneous species was done in lines 6.71 metres apart and supplemented by polythene container plants of Neem, Tamarind and *Eucalyptus* hybrid at varying espacements of 4.57 metres by 4.57 metres or 3.35 metres by 3.35 metres. In areas where *kumri* could not be done, container plants were put at the espacements noted above. From 1962, the demand for *kumri* cultivation in the Udumalpet Range has been steadily building up. In 1963, all the felled coupes in the range were planted in conjunction with field crops. The present practice in the range is to give the right for *kumri* cultivation free to any husbandman who comes forward to undertake it, subject to the condition that he supplies free labour for planting and weeding the forest crop. Such an incentive seems necessary until the demand for *kumri* in the range is fully established. The condition of the miscellaneous fuel plantations raised so far in the Udumalpet Range is generally satisfactory. While the indigenous fuel species perform well, *Eucalyptus* hybrid seems to fail affer 1 or 2 years except along moister depressions or along stream or river banks (e.g. Chinnar). Drought appears to be the limiting factor for the species.

394. The following statement gives details of the areas planted in the Udumalpet Range :—

Year of planting. (1)	*Species planted.* (2)	*Area in hectares.* (3)	*Remarks* (4)
1957	*Ailanthus excelsa and Salmalia malabarica*	29·54	..
1958	*Ailanthus excelsa and Salmalia malabarica* ..	33·18	..
1958	*Eucalyptus* hybrid	4·05	
1959	*Eucalyptus* hybrid	6·48	..
1959	*Ailanthus excelsa*	63·13	..
1960	Miscellaneous fuel species	31·57	..
1960	*Ailanthus excelsa*	55·85	..
1961	Miscellaneous fuel species	21·65	..
1962	Miscellaneous fuel species	32·37	..
1962	*Eucalyptus* hybrid	1·31	..
1963	Neem and Tamarind	20·23	..
1963	Neem and *Eucalyptus* hybrid	22·26	Of this a portion of 12 hectares has been planted with bamboos.

D. BAMBOOS.

395. The earliest reference in working plans to the exploitation of bamboos is in the 1896 plan by Gass for Ayerangal, wherein it was prescribed that " such bamboos as are found in the block will be cut and sold departmentally ".

396. *Foulkes' Working Plans* of 1902 did not prescribe any bamboo fellings either in the Pollichi or Udumalpet Ranges on the ground that they were marketable only to a very small extent.

397. *Dyson's Working Plan* of 1923 for the Pollachi Range makes mention of bamboos having been worked on a " 5 year rotation " in three bamboo felling series. Dyson constituted the whole of the Pollachi Range into a Bamboo Working Circle which was divided into 6 felling series, each series containing 3 coupes on a " 3 year rotation ".—(i) Pothamadai, (ii) Ayerangal Upper, (iii) Ayerangal Lower, (iv) Pachathanni, (v) Villoni and (vi) Thadaganachi.

398. From 1916, bamboos of Udumalpet Range were put up for sale on a three year felling cycle with partial success.

399. *Wood's* 1919 *working plan* for the Mount Stuart forests constituted a Bamboo Working Circle which included the whole of the Tunacadavu Range. Wood considered bamboos to be a nuisance in these forests and the proposals contemplated leasing out the area for clearfelling to be followed by concentrated regeneration of teak or other timber species. The results of such work are already embodied under the section on deciduous timber forests.

400. *M. V. Laurie's working plan* (1930–32 *to* 1940–41).—Since the bamboos of Tunacadavu Range had flowered and died between 1926 and 1930, except for small scattered areas, Laurie did not lay down any series of annual coupes to be sold. For the first five years of the plan, the whole area of the Bamboo Working Circle was prescribed to be sold every year after a working scheme prescribing coupes to be sold in rotation was to be drawn up.

401. *Results*.—The right to collect bamboos from the whole of the Tunacadavu Range was sold in auction almost every year from 1932–33. No working scheme prescribing annual coupes to be sold in rotation was however drawn up.

402. *A. N. Sarma's Working Plan* (1935–36 *to* 1940–41).—This working plan which was drawn up almost at the same time as Laurie's plan for the rest of the forests of the division, included an area of 25.547.31 hectares in the Bamboo Working Circle. Eleven felling series were constituted; 6 in Pollachi Range, 1 in Punachi Range and 4 in Udumalpet Range. A felling cycle of three years was adopted and a set of felling rules was drawn up.

403. *Results*.—The bamboo coupes were auctioned every year as prescribed and were generally sold at satisfactory prices.

404. *T. V. Venkateswara Ayyar's Working Plan* (1941–42 *to* 1953–54).—T. V. Venkateswara Ayyar's integrated working plan for the whole division had 14 felling series in his Bamboo Working Circle, including 2 felling series (Thekkadi and Tellikal) which now form part of the Kerala State. The areas comprising of the present Tunacadavu Range were constituted into one series, but the Ulandi and Palakadavu Blocks were excluded from working due to their inaccessibility. The other prescriptions were the same as in Sarma's working plan.

405. *Results*.—There was fair demand in most of the series, but from 1952–53 onwards several of the bamboo coupes in Udumalpet Range remained unsold on account of gregarious flowering in this area.

406. *Bhoja Shetty's Working Plan* (1954-55 *to date*).—This working plan had the same prescriptions as in the previous plan.

407. *Results*.—In actual working, the prescriptions of the plan underwent several changes. The Thekkadi and Tellikal Series were transferred to Kerala State in 1956 following ' States Reorganisation '. With the construction of the Ulandy Valley Road, a new series, viz : the Ulandi Felling Series was formed in 1959, to exploit the bamboos in the Ulandi and Palakadavu Blocks of Tunacadavu Range. Due to gregarious flowering of bamboos which commenced in 1952–53, most of the bamboo coupes in the Udumalpet, Pollachi and Punachi Ranges have not been sold regularly. Wherever they were sold, the prices obtained also have not been satisfactory.

408. The working of bamboos has left much to be desired. Most of the coupes were worked much too heavily, totally ignoring silvicultural and agreement conditions. Extraction of immature culms leaving the top-ends and bottom pieces in the culm itself have been the two most common evils of bamboo working. The latter has been primarily responsible for causing clump congestion.

409. In 1961–62, an experiment was made to work a portion of Topslip Bamboo Coupe III departmentally as per silvicultural principles. The extraction was done along the fringes of the 1927 teak plantation. In addition to the retention of a minimum number of 6 mature culms and all culms below one year, sufficient number of bottom pieces of previous working (both green and dead) were also left to stand to provide protection and support to the culms retained. The extracted produce was periodically offered for sale but there was no reasonable demand. A portion of the bamboos was sold in auction to the public and the balance sent to Messrs. Seshasayee Papers and Boards at Pallipalayam which came into being the same year. The operation unfortunately proved to be a loss; the expenditure incurred was Rs. 14,342 while a revenue of Rs. 6,390 was realised by sale and Rs. 6,797 as royalty from the mills. The idea of departmental working of bamboos was therefore given up. The unworked portion of the coupe was sold in auction during 1962–63.

410. From 1962–63, 75 per cent of the estimated yield of bamboos in the coupes of both the felling series in the Tunacadavu Range have been earmarked for supply to Messrs. Seshasayee Papers and Boards at Pallipalayam. This left only 25 per cent of the estimated annual yield of each coupe for public supply. This restriction in sale in the open market had an immediate effect in skyrocketing the prices fetched for these coupes. The contract for mill supply brought in an incentive for the bamboo coupe contractors to extract all the green bottom pieces left standing during previous working for supply to the mill. Prior to this, there used to be little demand for these bottom pieces as they are heavy and difficult to handle. The exploitation of bamboos for the paper mill in no way improved bamboo working in the division. The heavy over-exploitation continued.

411. *Bamboo regeneration.*—Planting of *Bambusa arundinacea* was undertaken on a small scale of 12 hectares annually in the Tunacadavu and Punachi Ranges with effect from 1961–62. The bamboos were planted in cleared lanes 6.71 metres apart in standing high forest devoid of bamboos. The espacement between the plants in each lane was also kept at 6.70 metres. The results are not gratifying as the heavy shade and competition proved detrimental to the seedlings.

412. During 1963, an area of 12 hectares in a failed fodder plot in the Udumalpet Range was planted with *Bambusa arundinacea*. The area was ploughed and bamboo planted at an espacement of 6.71 metres × 6.71 metres in conjunction with *kumri*. Fuel species like *Eucalyptus* hybrid and Neem were also planted in mixtures. The bamboo has come up exceedingly well and clump formation was noticed even within 6 months of planting.

E. MINOR FOREST PRODUCE

413. In 1862, an Overseer was appointed to supervise the departmental collection of minor forest produce in the areas constituting the present Pollachi, Punachi and Udumalpet Ranges. The arrangement continued until 1905–06. In the areas comprising of the present Tunacadavu Range, no attempts were made to collect minor forest produce either departmentally or otherwise until the advent of Laurie's plan.

414. In 1879, Government allowed the hill-tribes of the division the right to collect and enjoy minor forest produce without prejudice to the right of Government to collect them, sales being allowed only to Government or their agents. This right was recognised at the time of forest settlement.

415. In 1905–06, the Anamalai Planters' Association bought the right to collect minor forest produce from the Punachi Range since it gave them control over the local labour and reduced theft from their estates. This arrangement continued till 1913–14, when

the lease was extended over to the Ulandi and Palakadavu Blocks and a portion of the Pollachi Range also at negotiated rates fixed by Government. In 1922–23, the portion of Pollachi Range was excluded from the lease. Subsequently, on an audit objection, the area leased to the Anamalai Planters' Association was restricted to a range of 3.22 kilometres from the estate limits. The area excluded was auctioned annually. In 1930, since the planters again requested the produce to be sold to them, the right to collect cardamoms alone from the Punachi Range and the Ulandi and Palakadavu Blocks, and the right to collect other minor forest produce only with a range of 3.22 kilometres from the estate limits was given to them. The right to collect other minor forest produce elsewhere in the excluded area was sold in auction. In 1933–34, at the intercession of the Collector, the right to collect the produce from the Punachi and Ulandi Ranges was again given to the Anamalai Planters' Association for a period of 12 years at Rs. 1,200 per year. Elsewhere in the division, except in the Tunacadavu Range, the right of collection of minor forest produce was sold in auction regularly.

416. *M. V. Laurie's Working Plan* (1931–32 *to* 1940–41).—Laurie constituted a Minor Forest Produce Working Circle which included the whole of the Tunacadavu Range. Departmental collection of all minor forest produce was prescribed with a view to control forest fires and to learn more about this neglected source of revenue.

417. *Results.*—The prescriptions could not be put into practice mainly for want of labour. Honey and wax were however collected departmentally from 1938–39 and marketed through the Forest Utilization Officer.

418. *A. N. Sarma's Working Plan* (1935–36 *to* 1940–41).—Sarma constituted a Minor Forest Produce Working Circle covering the rest of the division. Excepting for ivory and deer horns which were to be collected departmentally, the other produce were to be sold in auction. Gall-nuts, *Avaram* bark (Udumalpet Range only) and *Cassia fistula bark* which have a specialised demand for the tanning industry were prescribed to be sold separately for each range, but *Cassia fistula* bark was to be sold only once in 5 years. The right to collect rest of the produce was to be sold, each range forming a unit of sale.

419. *Results.*— The working plan prescriptions were adhered to in the main. From 1938–39, honey and wax were collected departmentally as in the Tunacadavu Range for sale through the Forest Utilisation Officer.

420. *T. V. Venkateswara Ayyar's Working Plan* (1941–42 to 1953–54).—This working plan had the same prescriptions as in the previous plans. Notwithstanding its earlier failure, departmental collection of minor forest produce was again prescribed in the Tunacadavu Range. In the rest of the division, Sarma's prescriptions were to be continued.

421. *Results.*—Departmental collection of minor forest produce in the Tunacadavu Range again proved unworkable due to shortage of labour. The right to collect minor forest produce in the range was therefore sold in auction annually as in the other ranges, but in 1953, it was decided to give this lease at negotiated rates to the Tunacadavu Range Hill Tribes' Co-operative Society which was formed during the same year. The lease granted to the Anamalai Planters' Association expired in 1942–43, and thereafter minor forest produce in the Punachi Range was sold in auction regularly as elsewhere in the division.

422. *K. A. Bhoja Shetty's Working Plan* (1954 *to date*).—Under this plan, leasing minor forest produce in the Tunacadavu Range to the Hill Tribes' Co-operative Society was prescribed to be continued. In the rest of the division, minor forest produce was to be sold in auction as before, but new units were formed for certain items of produce which have a specialised or local demand only, viz : *Euphorbia* bark in Udumalpet Range, reeds in Punachi Range, and Lemon Grass in the Pollachi, Punachi and Udumalpet Ranges. Lease of lands suitable for cardamom cultivation in the evergreen forests of Punachi Range was also suggested.

423. *Results.*—As in the other working circles, the prescriptions of the Minor Forest Produce Working Circle of Bhoja Shetty's working plan also underwent several changes in the course of actual implementation. Natural cardamom occuring in the gaps caused by felling in the sleeper coupes of Punachi Range was constituted as a separate unit with effect from 1956–57. Since 1961–62, this item is being collected departmentally. Tending of gaps by such operations as weeding and cutting of useless growth smothering cardamom regeneration, spacing out cardamom seedlings and mulching during the hot weather have also been done with good results. The exploitation of canes was stopped in 1959—*vide* Chief Conservator's Rt. No. 304/5, dated 6th March 1959, according to which canes are to be leased out only once in 5 years in order to give rest to the plants to recover. With the enactment of the Panchayat Act in 1960, the unreserves and porambokes are vested with the concerned panchayats. Consequent to the changed status, with effect from 1960–61, the right to sell *Avaram* bark in the unreserves and porambokes of Udumalpet and Dharapuram Taluks which was hitherto exercised by the department, had to be surrendered to the panchayats concerned. With effect from 1962–63, the *vcidah* for gallnuts has been changed to two years.

424. In 1956, a co-operative society for the hill tribes of Punachi Range was constituted just as in the Tunacadavu Range. Four items of minor forest produce lease units in the Punachi Range., viz: reeds, gallnuts, cardamom and other minor forest produce were leased out thereafter year after year at negotiated rates fixed by the Government. During 1960–61, the society could not pay the lease amounts due to the misappropriation of its funds by the Secretary (an official lent by the Co-operative Department) and its inability to work the lease units. The District Forest Officer therefore resold the above lease units in open auction and the society was directed to make good the loss of Rs. 3,020 sustained by Government in the resale. On the society's appeal to Government, a token sum of Rs. 100 only was ordered to be recovered and the balance amount of Rs. 2,020 was waived.

425. The Tunacadavu Range Hill Tribes' Co-operative Society also didn't function satisfactorily until 1962. The society lost an amount of Rs. 12,000 at the time of reorganisation of States due to issue of provisions on credit tohill tribes who remained behind in the Thekkadi leased forests. This loss had to be wiped out by profits earned subsequently. Since 1962, the society has made rapid gains and is now working with profit.

426. As prescribed by Bhoja Shetty, cardamom leases were granted during 1959 in the undeveloped shola forests of Punachi Range. The areas leased out and the amounts realised, etc., are given below :—

Locality.	Bit number.	Area in hectares.	Total lease amount in rupees.	Period of contract.
(1)	(2)	(3)	(4)	(5)
Iyerpadi ..	I	10·12	10,050	20 years for all leases.
Iyerpadi	II	10·62	5,932	
Iyerpadi	III	9·92	10,559	
Iyerpadi	IV	9·61	13,300	
Iyerpadi	V	10·12	15,000	
Iyerpadi	VI	9·92	9,230	
Iyerpadi	VII	9·92	7,595	
Sheikalmu li	I	9·31	14,030	
Sheikalmu li	II	10·12	14,000	

427. As there was no reasonable demand subsequently, no further area was leased out for cardamom cultivation.

F. GRAZING.

428. Till 1888, grazing was allowed free in the forests of the division. In that year, grazing permits were introduced, the rates being 50 paise per buffaloe, 25 paise per cow and 12 paise per sheep. Goats were excluded. Since then there have been several changes in the grazing fees until the present rates were prescribed in 1938. These rates are the same as fixed in 1888.

429. The grazing year was from 1st April to 31st March until 1911–12, when the present grazing year from 1st July to 30th June was brought into vogue.

430. Penning is allowed in approved pens within the forests. Till 1921, a fee of one rupee was charged to each permit holder to pen his cattle in an approved pen. In 1922, the penning fee was abolished.

431. In the Pollachi Range, Gass's working plan of 1896 prescribed the total exclusion of cattle from working plan areas. But Foulkes' working plan of 1902 closed only fuel coupes to grazing for a period of 5 years following felling.

432. Dyson's 1923 working plan prescribed that with the exception of fuel coupes less than 5 years old, the forest should remain open to grazing, since closure would spread prickly pear.

433. In the Udumalpet Range, elaborate restrictions on the number of cattle to be admitted were enforced from time to time under various schemes constituting grazing blocks and extensive areas were closed to grazing. These schemes became obsolete consequent on Government declaring in G.O. No. 595, Development, dated 29th April 1932, that cattle may be grazed on a single permit anywhere in a forest division.

434. The Kukkal and Kudrayar blocks transferred from Madurai District were permanently closed to grazing with effect from 1936—*vide* Chief Conservator's D. Dis. 563/36, dated 3rd July 1936, in order to protect the rare 'white bison' which is believed to occur in this locality.

435. The whole of the Punachi Range except the eastern slopes of the Thorakadavu Valley and compartment 1 of the Punachi Block were closed to grazing with effect from 1930—*vide* Chief Conservator's Proceedings No. 147, dated 17th March, 1939. The latter was kept open as a special case to permit local residents of Attakatti to graze their cattle subject to a maximum of 30 heads per cattle on payment of a special grazing fee of Rs. 2.50 per head. This was later modified in 1937 to include also compartment 2 of the Punachi Block and in addition an area of 1,181.69 hectares as shown below—*vide* Chief Conservator's Proceedings Miscellaneous No. 58, dated 5th February, 1937.

Locality (1)	*Area in hectares.* (2)
(*a*) Ibex Hill	315·66
(*b*) Koramparai	595·70
(c) Between Chinnathalanarmalai and Kavurkalmalai adjoining Mount Stuart Estate on the south-east.	271·95

436. The whole of the Tunacadavu Range was closed to grazing with effect from 1933—*vide* Chief Conservator's Proceedings No. 434, dated 9th September 1963, except for cattle belonging to the subordinates and local labour and kept for their bonafide domestic use, at the rate of one cow or she buffaloe for each member subject to a maximum of 120 heads of cattle. These cattle were allowed to graze free.

437. *A. N. Sarma's Working Plan* (1935–36 *to* 1940–41) : A. N. Sarma prescribed the closure of felled fuel coupes for a period of 10 years from the year of felling.

438. *T. V. Venkateswara Ayyar's Working Plan* (1941–42 *to* 1953–54) : Venkateswara Ayyar continued the same prescriptions, but suggested restricted rotational grazing after 3 years in special grazing paddocks to avoid complaints from the public about reduction in grazing areas caused by long closures. Special grazing fees were suggested to be levied for these blocks after obtaining the Government's concurrence.

439. *Results*.—The system of rotational grazing however did not work well due to lack of sufficient public co-operation.

440. *K. A. Bhoja Shetty's Working Plan* (1954–55 *to date*).—Bhoja Shetty reduced the period of closure of fuel coupes after felling to 5 years, but suggested the continuance of the system of rotational grazing initiated in the previous working plan. He also

increased the maximum permissible number of cattle to graze in the Tunacadavu Range to 200 heads consequent to the increase in the resident staff and labour force in the range.

441. *Results.*—The system of rotational grazing was enforced with partial success in the Pollachi Range only. As a portion of the Tunacadavu Range was transferred to Kerala State on 1st November 1956 following ' States Reorganisation ', the maximum number of cattle permitted to graze was reduced to 60 heads with effect from 1962–63—*vide* Chief Conservator's Proceedings Rt. No. 920/62, dated 3rd June, 1962.

G. FIRE PROTECTION.

442. Fire protection in the division was first initiated in 1889, when the Dhali Reserved Forest and parts of the Anamalai Reserved Forest, south of Sethumadai were fire-protected. The system was extended later to all the outer slopes of the division. The method of fire-protection then followed consisted of tracing of fire lines and employment of fire watchers during the hot season. Arbuthnot's working plan of 1908 for the Punachi Range mentions that 69 kilometres of fire lines had been formed till that date within the Punachi Block.

443. *Habibullah's Working Plan* (1919.20 *to* 1934.1935) for the Udumalpet Range prescribed that fuel coupes should be fire protected for 10 years after felling by employing 4 fire watchers for 4 months from the 15th of February. Boundaries of enclosures and temples and 17 kilometres of rights of way were to be fire-traced.

444. *Dyson's Working Plan* (1923–24 *to* 1934–35) for the Pollachi Range did not prescribe any fire-protection measures as he considered that fires would do ' little damage '.

445. *Wood's Working Plan* (1919–29 *to* 1930–31).—Wood prescribed for the Tunacadavu Range a detailed plan of fire-protection consisting of a carefully worked out system of fire lines and patrols estimated to cost approximately Rs. 2,000 per annum.

446. *Results.*—This scheme was partially carried out for 3 years between 1919 and 1921 at a cost of approximately Rs. 14,000 per annum, after which protection was exclusively confined to the regeneration areas and depots due to insufficient labour.

447. *M. V. Laurie's Working Plan* (1931–32 *to* 1940–41).—Laurie laid down an elaborate system of fire-protection in the Tunacadavu Range under which all outer boundaries were to be fire-traced to keep out external fires. Internal protection was to be ensured by surrounding plantations by an external line 15 metres wide and common boundaries between contiguous plantations by lines 3.6 metres wide. Coupes in which gaps had been regenerated were also to be protected by lines 3.6 metres wide around them. Fire patrols were to be engaged and look out towers were suggested. The total estimated annual cost of fire-protection was Rs. 2,400.

448. *Results.*—The prescriptions laid down in the working plan were generally carried out for the first 3 or 4 years, except that no look out towers were built. In the hot weather of 1935, fires were extensive and severe, causing lot of damage to both plantations and natural forest. After this, fire protection measures adopted in the range were severely curtailed. Plantations over two years were not fire protected and the total length of outer boundaries fire-traced annually was reduced. Selection coupes were also removed from protection consequent on the stoppage of gap regeneration.

449. *A. N. Sarma's Working Plan* (1935–36 *to* 1940 41).—Sarma prescribed fire-tracing a 15 metres wide external line along the Plantation Working Circle boundary and 4.6 metres wide internal lines between the individual compartments of the Punachi Block. In the Fuel Working Circle, fire-tracing of all roads, paths, important rights of way and camping places were to be done. In addition, cutting of a guide line 0.91 metre wide, about two metres away on either side of the path was also prescribed.

450. *Results.*—All the above prescriptions were regularly carried out.

451. *T. V. Venkateswara Ayyar's Working Plan* (1941–42 *to* 1953–54).—Venkateswara Ayyar revived the method of general fire-protection followed in the Tunacadavu Range prior to 1935 with some changes. The following are the general fire protection measures suggested by him.

(i) *Tunacadavu Range.*—(*a*) Fire-tracing of timber depots and buildings; (*b*) Employment of fire patrols during the dry season; (*c*) Burning of broad fire lines mainly along outer boundaries between guide lines which were specified.

In addition to these general fire-protection measures, special protection of teak plantations was sought by fire-tracing external boundaries 6 metres wide and internal lines between plantations 3.6 metres wide.

(ii) *Punachi Range.*—In the Punachi Range, Sarma's prescriptions for the Punachi Block were to be continued. In addition, fire tracing of the Punachi Ghat Road to a length of 1.15 kilometres from the 11th mile 3rd furlong to the Waterfall Estate was also suggested. Special fire-protection was to be accorded to the Lower Punachi teak plantations just as in the Tunacadavu Range.

452. In the other two ranges, no fire-protection measures were prescribed.

453. *Results.*—" All the fire-protection measures prescribed in the working plan were followed " (K. A. Bhoja Shetty).

454. *Bhoja Shetty's Working Plan* (1954–55 *to date*).—This working plan prescribed the same measures as in the previous plan. In addition, fire-tracing of guide lines 6 metres wide all round the periphery of the sholas in the Grass Hills was suggested. Sowing of wattle seeds in these lines was also prescribed.

455. *Results.*—The fire-Protection measures prescribed in the working plan were regularly carried out. The prescriptions to fire-trace the Punachi Ghat Road seemed unnecessary as this road has been black topped throughout and the Highways Department which is in charge of it regularly cuts the undergrowth on either side. The road as it is, acts as an effective fire-break.

H. LAC CULTIVATION.

456. Lac cultivation on *Schleichera oleosa* was suggested by Bhoja Shetty. The areas selected by him lie in the Thekkadi leased forests which were transferred to Kerala State in 1956. Nevertheless, lac cultivation was initiated in the Tunacadavu Range during 1957–58 as one of the development schemes under the '-Second Five-Year Plan'. The locality selected was Varagaliar in the Ulandi Block. Four farms were constituted and all the trees of *Schleichera oleosa* in each block were infected in a cycle of 1-1/2 years. The harvested lac was sent to the lac factory at Cumbum. The yields obtained were poor as the rainfall of over 250 centimetres received in the locality prevents the young insects from settling down particularly for the *Aghani* crop. Further operations were therefore discontinued with effect from 1963–64. The following statement gives details of the cost of lac cultivation and the quantity of lac obtained between 1957–58 and 1962–63.

Year. (1)	*Cost of producing and harvesting lac.* (2) RS.	 P.	*Cost of brood lac obtained from Cumbum.* *Quantity.* (3) KGS.	 *Cost.* (4) RS.	 P.	*Yield obtained and sent to Cumbum factory.* (5) KGS.
1957–58	222	37	362·87	..		111·58
1958–59	1,749	30	662·24	..		225·89
1959–60	1,497	92	1,088·62	3,310	98	483·05
1960–61	2,649	95	907·18	2,804	88	574·00
1961–62	1,309	25	1,360·77	6,341	48	579·24
1962–63	1,905	20	1,503·20	3,991	10	852·50

457. *Planting of lac hosts.*—Planting of lac hosts was also carried out in the Tunacadavu Range. From 1957 to 1959, an area of .4 hectare (1 acre) was planted annually with natural seedlings of *Schleichera oleosa* obtained from the surrounding natural forest. The seedlings were planted in standing high forest in 0.6 metre wide cleared lanes kept 3.35 metres apart. The espacement within the planting lines was also kept at 3.35 metres. During 1959, an area of 2 hectares was raised with *Schleichera oleosa.* The area regenerated was increased to 8 hectares in 1961, and 10 hectares in 1962. The espacement between the lanes was also increased to 6.7 metres at the same time. The results of planting are on the whole discouraging. As lac cultivation in the range was given up with effect from 1963, no further planting was done.

458. *Moghania macrophylla,* a new lac host was planted over 0.4 hectare of cleared area near Varagaliar during 1961. Another area of 0.4 hectare was also planted at Topslip during 1962. Seeds were sown in prepared patches at an espacement of 1.83 metres into 1.21 metres. The species appears to come up luxuriously in the open, but has the disadvantage of attracting game. No further planting was done during 1963.

I. EX-PANCHAYAT FORESTS.

459. The history and management of the ex-panchayat forests of Dharapuram Taluk prior to 1921 is not known. When these areas were resumed by the Forest Department in 1951, they were virtually in a denuded condition.

460. Although Bhoja Shetty's revised working plan (1954–55 to date) covered these forests, unfortunately no prescriptions were made in this plan to rehabilitate these degraded areas. Only mere protection was suggested to be accorded.

461. In 1958 a temporary scheme to rehabilitate the ex-panchayat forests was drawn up by A. Olimuthu, then District Forest Officer. This scheme met with the Chief Conservator's sanction only in 1962. The scheme prescribed two regeneration schemes depending on the soil suitability of the area—(*i*) Regeneration after tractor ploughing wherever this was possible, and (*ii*) Regeneration by the 'saucer' or 'sunken mound' method wherever tractor ploughing was not possible. Two series were constituted with 15 coupes in each series with prescriptions to plant one coupe annually with fuel species such as Acacias, Neem, *Albizzia amara, Albizzia lebbek, Butea monosperma, Dalbergia sissoo, Feronia limonia, Hardwickia binata, Bauhinia purpurea, Pongamia pinnata, Syzygiun cumini, Anacardium occidentale and Lannea cromandelica.*

462. As the above scheme was sanctioned only in 1962, no work has yet been done based on these prescriptions. However, some regeneration work was carried out regularly in the Thalavoipattanam Reserved Forest from 1957 to 1960. Container plants were planted in 'saucers' or 'sunken mounds' or sometimes even in .3 metre cube pits without adopting any water conservation technique. No regular espacement was adopted and planting was done wherever there were gaps in the forest. The plants put were mostly the better type of species such as *Albizzia lebbek, Dalbergia sissoo* and *Ailanthus excelsa* which are quite unsuitable for these areas with inhospitable soil and weather conditions. Practically all the plantations failed except for portions of the 1959 and 1960 regeneration areas where some Neem was planted and watering is said to have been done during the hot weather. No plantin gwas done during 1961 and 1969.

463. During 1963, an area of 10.52 hectares was regenerated mainly with container plants of *Acacia planifrons* in 0.3 metre cube pits without adopting any elaborate technique, but a small area of about 0.8 hectare of low lying land within this area was planted with Eucalyptus hybrid adopting the 'trench and mound' technique. It is too early to state the results of this plantation now.

464. A statement showing the particulars of areas regenerated in the Thalavopattanam reserved forest between 1957 and 1963 is given below :—

Year of Planting.	Area in hectares.	Expenditure incurred during the first year.		Maintenance charges	
				2nd year.	3rd year.
(1)	(2)	(3)		(4)	(5)
		RS.	P.	RS.	RS
1957	8·09	1,579	00	..	..
1958	11·94	764	00	139	..
1959	10·32	670	00	192	62
1960	11·33	465	00	149	378
1963	10.52	613	90	..	..

465. Notwithstanding these attempts at artificial regeneration, it must be said in unequivocal terms that protection alone has vastly improved the conditions of these forests after the take-over from the panchayats.

SECTION 3—SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN.

466. *Planting of Ocimum kilimandscharicum as a cover-crop in the younger teak plantations.*—Experimental planting of *Ocimum kilimandscharicum* as a cover crop in the younger teak plantations of Tunacadavu Range is being tried with effect from 1958. During 1958, .4 hectare in the Ulandi 1957 plantation was planted with Ocimum seedings. During 1959, *Ocimum* seeds were sown over 4 hectares in the plantation raises during the same year. During 1960, an area of 16.18 hectares in the current year's teak plantation was broadcast sown with *Ocimum* seeds and planting of *Ocimum* seedlings done over 12.14 hectares. In all these cases, the soil was worked with *mammuttica* before sowing. The species comes up luxuriously whether sown or planted.

467. *Afforestation of the Grass Hills.*—Afforestation of the Grass Hills in the Punachi Range was first taken up in 1954 when an area of .02 hectare was planted with Black Wattle (*Acacia mearnsii*). During 1955, an area of 6.07 hectares was planted with Black Wattle. From 1956, it was proposed to plant an area of 40 hectares annually with Black Wattle under the Second Five-Year Plan Scheme entitled 'Creation of Industrial Plantations like wattle and Blue Gum'. As the results of wattle planting proved to be disappointing, further planting with this species was discontinued in [illegible]. Instead, Blue Gum (*Eucalyptus globulus*) was planted during 1960 and 1961 over a much smaller area. This species too was not successful and therefore the scheme itself was discontinued with effect from 1962. Nevertheless, attempts were made even after this to experiment the possibility of discovering a species suitable for afforesting the tract. Casualties in the Blue Gum plots were replaced with *Eucalyptus* hybrid without any success. During 1962, Rose Gum (*Eucalyptus grandis*), Swamp mahogany (*Eucalyptus robusta*) and two other unknown species of *Eucalyptus* were tried over a small area of 2.02 hectares. Of these three, *Eucalyptus robusta* presently appears to do better than the rest, but it is too early to opine conclusively about the suitability of this species in afforesting the Grass Hills. Earlier in 1959, *Cupressus macrocarpa* was planted over 5.67 hectares in a failed wattle plantation without any sustained success. In all these cases, the grass was scraped to a width of 1½ metres along the planting lines and pits 30 centimetres cube dug at an espacement of 3.35 metres by 3.35 metres. Soil working to a width of 0.90 metre around the plants is also said to have been done.

468. The strong winds and very heavy annual rainfall of over 500 centimetres received by this locality appear to be the chief reasons for the poor results achieved so far. Annual fires, severe root competition from coarse grasses and the general inaccessibility of the region are other deterrent factors. The soil is also very shallow over the slopes and any future planting done must be confined only to the Konalar Valley where the soil is reasonably deep.

469. The following statement gives details of the plantations raised in the locality with their cost of formation and maintenance. The expenditure quoted under maintenance during the subsequent years covers the cost of replacement of casualties with other species also.

Year of planting.	*Area planted in hectares.*	*Species raised.*	*Cost of formation.*		*Cost of maintenance.*					
					2nd year.		*3rd. year.*		*4th year.*	
(1)	(2)	(3)	(4)		(5)		(6)		(7)	
			RS.	P.	RS.	P.	RS.	P.	RS.	P.
1954	2·02	*Acacia mearnsii*	202	00	133	10	220	00	65	40
1955	6 07	*Acacia mearnsii*	2,630	00	156	40	215	00	51	50
1956	40·00	*Acacia mearnsii*	5,265	00	1,187	00	375	50	295	00
1957	40·00	*Acacia mearnsii*	5,625	00	410	00	467	00	136	04
1958	40·00	*Acacia mearnsii*	7,133	00	950	00	429	00	117	00
1959	40·00	*Acacia mearnsii*	4,525	02	1,127	00	325	00	127	00
1960	14·16	*Eucalyptus globulus* ..	4,486	54	248	00	220	00	120	00
1961	18·21	*Eucalyptus globulus* ..	1,556	00	34	50	45	75	..	
1962	8·09	*Eucalyptus globulus* ..	2,209	65	1,104	25	..		..	
1963	2·02	*Eucalyptus globulus* ..	519	89	..		..		—	

470. *Planting of Eucalyptus grandis.*—An area of 24.28 hectares in the Anamalais was resumed from the Cinchona Department during 1962 and planted with Rose Gum (*Eucalyptus grandis*). Container seedings of *Eucalyptus grandis* were obtained from Munnar and some of the local tea estates and planted in 0.3 metre cube pits dug and kept ready. During 1963, an additional area of 40.47 hectares was resumed from the Cinchona Department and planted with *Eucalyptus grandis* from nursery stock raised in the division. *Eucalyptus grandis* seeds were obtained from Munnar and sown in standard nursery beds. The seedlings were pricked out into polythene containers when 2½ to 5 centimetres high and transplanted in the field when about 15 to 25 centimetres high following the practice adopted in the estates. The plants were weeded thrice during the first year. In the second year, only one weeding was done. The plants have come up very well despite the fact the areas resumed from the Clinchona Department were kept fallow and used as grazing ground for some years.

471. Apart from the plantations raised at Cinchona, an area of about one hectare of natural forest adjoining the Range Office at Waterfalls was cleared and burnt during both 1962 and 1963 and planted with *Eucalyptus grandis along* with field crops. *Ragi* was the *kumri* crop raised. Here too, *Eucalyptus grandis* has come up exceedingly well. Some of the plants of the 1962 plantation attained a height growth of over 3 metres at the end of the first year.

472. Both at Cinchona and at Waterfalls, several seedlings of *Eucalyptus grandis* of Munnar origin exhibit a strong resemblance to *Eucalyptus robusta* suggesting possibilities of hybridisation between these two species.

473. *Planting of Eucalyptus hybrid along the Chinnar.*—An area of about 1.21 hectares along the banks of the Chinnar in the Udumalpet Range was cleared and planted with *Eucalyptus* hybrid during October 1962 with a field crop of cotton. During 1963, another area 2.42 hectares was similarly prepared and planted with *Eucalyptus* hybrid. In both these cases, the *Eucalyptus* hybrid has come up exceedingly well, although by and large the species has not proved successful in the rest of the range.

474. *Raising of fodder Plots.*—Under the Second Five-Year Plan Scheme 'Creation of fodder plots and improvement to grazing', *Kolukattai* grass (*Cenchrus ciliaris*) was raised in the Pollachi and Udumalpet Ranges annually between 1958 and 1960. During 1968, the grass seeds were sown in cleared lanes 6 metres apart within the existing stand of natural forest. From 1959 onwards, the areas selected were cleared and ploughed and *Kolukattai* grass seeds were broadcast sown over the whole area. Under both methods, the *Kolukattai* grass failed to establish amidst severe competition from the local grasses. The grasses also invited elephants which caused heavy damage. Since the results of fodder planting were not successful, the scheme was discontinued with effect from 1961. The areas cleared for planting fodder grass were planted with fuel species during subsequent years.

475. The following statement gives details of the folder plots raised in the division :—

Year of planting. (1)	*Range.* (2)	*Area planted in hectares.* (3)	*Total expenditure incurred.* (4)	*Species of grass sown.* (5)
			RS.	
1958	Pollachi	21·04	456	*Cenchrus ciliaris.*
	Udumalpet	29·54	1,559	*Cenchrus ciliaris.*
1959	Pollachi	24·68	1,030	*Cenchrus ciliaris.*
	Udumalpet	30·75	1,365	*Cenchrus ciliaris.*
1960	Pollachi	12·54	792	*Cenchrus ciliaris.*
	Udumalpet	28·73	1,784	*Cenchrus ciliaris.*

476. *Planting of spices.*—During 1960, 75 seedlings of cloves (*Syzygium caryophyllatum*) were planted partly in the Anaigundi shola under the shade of a tropical evergreen forest and partly in the open space in front of the Hill tribes' School at Anaigundi. The espacement adopted was 4½ metres by 4½ metres. None of the seedlings planted have established.

477. During 1963, 200 seedlings of cocoa (*Theobroma cacao*) and 150 seedlings of cloves were planted immediately behind the subordinates' quarters at Topslip under the shade of a moist deciduous forest. The espacement adopted was the same. A few trees in this area are said to have been removed before planting in order to give the plants dappled shade. At present only about 100 cocoa plants are alive, but none are healthy. Almost all the cloves planted have died.

478. *Planting of Alanthus triphysa and Evodia lunu-ankenda.*—A plot of 0.2 hectare near the Topslip Forest Rest House was cut and burnt during 1961 and planted with seedlings of *Ailanthus triphysa* and *Evodia lunu-ankenda.* A plot of 0.2 hectare was also similarly planted with *Ailanthus triphysa* at Varagaliar. In all the 3 plots, the plants have come up well.

479. *Planting of Eucalyptus saligna.*—A few seedlings of *Eucalyptus saligna* raised from seeds supplied by the Research Institute at Sao Paulo in Brazil, were planted in 1956 around the Range Office at Waterfalls. The plants have now grown into huge trees and are quite healthy.

480. *The Mount Stuart Tramway.*—Between 1888 and 1891, a tramway was constructed by Porter over a length of 11.26 kilometres between Topslip and Sungam to transport timber extracted from the Thekkadi leased forests. Only about 3½ kilometres of the whole length of the tramway lay in the present Madras State. The tramway was 0.6 metre guage and laid on corrugated metal sleepers. The total capital cost was Rs. 60.087. Bullocks were employed for traction. In 1904, the tramway was found to work at a loss; the gradient being too steep, the brakes were never effective, and the rails soon went out of shape. In 1919–20, the tramway was given up in favour of a road scheme.

481. *Water-power saw mill.*—In 1898, Gass installed a saw mill worked by water-power on the Tunacadavu River below Mount Stuart for the purpose of converting unsaleable logs of species other than teak, although teak also was sawn subsequently. The saw mill worked at a loss. The mill was swept away by a heavy flood in January, 1909, and the mill had to perforce close down in consequence.

482. *Wire Ropeway.*—In 1901, Gass constructed a wire ropeway to convey material sawn in the saw-mill mentioned above for transporting timber extracted from the Thekkadi leased forests from the head of the tramway at Topslip to the foot of the hills, to relieve the congestion on the ghat road. The total capital cost was Rs. 15,080 and it was designed to transport sawn material only. It worked at a loss and was closed down in 1909 with the closure of the saw mill.

483. *Semi-portable saw mill.*—In 1926, a semi-portable saw mill was installed at Pollachi at a cost of Rs. 35,408 to clear off the accumulation of stocks at the timber depot. In 1908, the mill was moved to Topslip at a cost of Rs. 12,704 for sawing small crooked logs which could not be sold at a profit at Pollachi, but very soon it became evident that the mill would not work at a profit unless better classes of logs were supplied. The mill was closed down in 1929.

484. *Telephone system.*—A telephone line between Anamalai Farm and Anaipadi in the Thekkadi leased forests was erected in 1912–13 by the Telegraph Department and handed over to the Forest Department in 1926–27 at a book value of Rs. 2,550. During the same year, the line was extended from Anamlaai Farm to Pollachi Timber Depot by the Forest Engineering Branch at a cost of Rs. 4,923. In 1933–34, Palakadavu was linked with Topslip by telephone, but this line was dismantled in 1938 when the Ulandi Range was closed down. Further connections from Anaipadi to the various workspots in the Thekkadi leased forests were also given. With the secession of the Thekkadi leased forests in 1956, the line from Topslip to Anaipadi and beyond was cut off and a new line put up connecting Anaigudi and Varagaliar. There are at present 6 connections at the following places, but the system is not in working condition.

(*i*) Pollachi—Timber Depot.
(*ii*) Anamalai Farm—Pollachi Range Office.
(*iii*) Sethumadai—Forester's Quarters.
(*iv*) Topslip—Range Officer's quarters and Range Office.
(*v*) Anaigundi—Forester's quarters.
(*vi*) Varagaliar—Forester's quarters.

485. The statement given below exhibit the roads, buildings, wells, etc., in the Coimbatore South Division with their capital cost, year of construction and average annual cost of maintenance.

(a) STATEMENT OF ROADS AND COMMUNICATIONS IN THE COIMBATORE SOUTH FOREST DIVISION.

Serial number and description (1)	*Year of construction.* (2)	*Length in kilometres.* (3)	*Cost of construction.* (4)	*Average annual cost of maintenance for the period from 1953–54 to 1962–63.* (5)	*Remarks.* (6)
		POLLACHI RANGE.			
				RS. P.	
1. **Pachathanni Cart-track**	1909–11	2·3127	142·47	....	Not being maintained,
2. Adivaram Road (**Sethumadai** Old road) ..	Not known.	3·4198	Not known.	....	Transferred to the Public **Works** Department for maintenance as per G. O. Ms. No. 1546, Food and Agriculture, dated 27th April 1960.
3. **Sethumadai Compound Road**	Not known.	0·2011	Not known.	....	The subordinates living in the compound are maintaining the road.
4. **Anamalai Farm Compound** Road	Not known.	0·3017	Not known.	....	The subordinates living in the compound are maintaining the road.
5. **Aliyar** Valley Road	1913–14.	2·4140	1,499·44	....	Not being maintained.
6. Pothamadai **Cart-track** .. .. —	1936–27.	3·4675	2,154·56	....	Not being maintained,
7. Nallar Cart-track	1930–31.	0·8000	50·00	....	Not being maintained.
8. Dawson Road	1935–36 and 1939–40.	3·4513	15,908·00	1,843·66	A length of 4·8280 kilometres lying within the Thekkadi leased forests was transferred to the Kerala State on 1st November 1956 following 'States Reorganistion'.
		TUNACADAVU RANGE.			
Mount Stuart Ghat Road (Sethumadai-Topslip-Sungam Road)	1925, 1927–28 and 1936–37.	19·111	2,50,771·00	15,114·92	A length of 5·432 kilometres lying within the Thekkadi leased forests was transferred to the Kerala State on 1st November 1956, following 'States Reorganisation'.
Topslip-Anaipady short cut road (formerly **known** as the Topslip-Tellikal road) ..	1927–28.	2·816	4,995·00	2,316·68	The Sethumadai—Topslip portion of the road was transferred to the Public Works Department for maintenance as per G. O. Ms. No. 1546, Food and **Agriculture, dated 27th April 1960**.

					The expenditure incurred pertains to the entire length of road up to 1959–60 only. Expenditure incurred beyond this date pertains to the ghat road portion of 9.660 kilometres left with the Forest Department for maintenance.
					A length of 12·271 kilometres lying within the Thekkadi leased forests was transferred to the Kerala State on 1st November 1956, following 'States Reorganisation.'
					Transferred to the Public Works Department for maintenance as per G.O. Ms. No. 1546, Food and Agriculture, dated 27th April 1960. The expenditure quoted in column 5 is up to 1959-63 only, as the road is being maintained by the Public Works Department since then.
3. Jeechali Road	1928–31 and 1936–37.	4.949	7,945·00	236·53	A length of 6.639 kilometres lying within the Thekkadi leased forests was transferred to the Kerala State on 1st November 1956, following 'States Reorganisation.'
4. Approach road to Mount Stuart Rest House.	1932–33 and 1935–36.	0.805	2,998·56	325·46	....
5. Anaigundi bridle path	1933.	12.963	1,082·05	83·92	Not being maintained since 1956–57.
6. Eastern approach road to Mount Stuart Rest House (Ulandi Valley Link Road)	1953–54.	1.006	8,978·75	763·54	....
7. Ulandi Valley Road	1955–58.	27.560	6,51,300·00	22,332·00	....
8. Chinnar Valley Extension Road	1961–62.	3.219	16,132·55	....	....
		Punachi Range.			
1. Aliyar Cart-track (Aliyar-Gundrac Road) ..	1922–23.	10.661	7,082·30	454·63	Being maintained by the Electricity Board from 1962–63.
2. Villoni bridle path	Not known.	19.312	Not known.	....	The bridle path lies in both Punachi and Pollachi Ranges.
3. Akkamalai-Konalar Road	1958–62.	9.656	57,715·42	6,368·98	....

(a) STATEMENT OF ROADS AND COMMUNICATIONS IN THE COIMBATORE SOUTH FOREST DIVISION—*cont.*

Serial number and description (1)	*Year of construction.* (2)	*Length in kilometres.* (3)	*Cost of construction.* (4)	*Average annual cost of maintenance for the period from 1953–54 to 1962–63.* (5)	*Remarks.* (6)
		UDUMALPET RANGE.			
1. Konalar Road	1912–13.	1.609	240·00	....	Not being maintained.
2. Kombu Road	1912–13.	2.011	1,123·00	....	Not being maintained as a portion of the road along with Kombu Forest Rest House were submerged in the Amaravathi reservoir.
3. Kallapuram-Manthorai Rest House Cart-track	1914.	5.833	1,442·62	302·25	A portion of the road measuring ·402 kilometres has been submerged in the Amaravathi reservoir. Another portion of the road about 2.615 kilometres from Kallapuram to the reserved forest boundary has been transferred to the Kallapuram Panchayat for maintenance as per Conservator's Orders (D. Dis. No. 1182/62–D.)
4. Cart-track from Chinnar to Sarakkupatti ..	1914.	1.207	Not known.	....	Not being maintained.
5. Cart-track from Chinnar to Kattalaparai Amman Koil near Kodanthur	Not known.	3.219	Not known.	....	Not being maintained.
6. Chinnar-Thalinji Road	1937–38.	7.452	304·00	....	Not being maintained.
		POLLACHI TIMBER DEPOT.			
1. Pollachi Depot Compound Road	Not known.	0.243	Not known.	217·00	

(b) STATEMENT OF BUILDINGS IN THE COIMBATORE SOUTH FOREST DIVISION.

Serial number and description.	*Locality.*	*Year of construction or purchase.*	*Cost of construction.*	*Average annual cost of maintenance for the period from 1953–54 to 1962–63.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)
			RS. P.	RS. P.	
		POLLACHI RANGE.			
1. Range Officer's quarters	Anamalai Farm ..	1923	3,652·00	35·80	....
2. Range Clerk's Quarters	Do. ..	1923	2,544·00	31·55	....
3. Lineman's Quarters	Do. ..	1923	1,660·00	29·42	....
4. Sub-lines	Do. ..	1923	2,595·00	49·99	....
5. Forest Rest House	Do. ..	1923	4,462·00	163·40	....
6. Kitchen attached to Rest House	Do. ..	1923	1,217·00	35·82	....
7. Motor garage attached to Rest House ..	Do. ..	1923	531·00	20·60	....
8. Combined Office and Clerk's Quarters (present Pollachi Range Office).	Do. ..	1923	2,553·00	16·33	....
9. Engine House and gin house	Do. ..	1923	5,443·00	..	Not being maintained.
10. Pollachi Range Officer's Quarters	Sethumadai	1885–86	762·00	30·04	Converted as residential quarters of Forester and Forest Guards' in G.O. Rt. No. 941, Food and Agriculture, dated 1st June, 1960.
11. Forest Rest House, kitchen and stable ..	Do. ..	1885–86	3,015·00	163·26	....
12. Subordinates' Quarters	Do. ..	1885–86	697·00	73·25	....
13. Forester's Quarters	Do. ..	1891–92	1,178·00	36·43	....
14. Forest Guards' Quarters	Do. ..	1915	1,229·00	93·47	....
15. Subordinates' lines	Thulukkamadai ..	1920–21	2,517·00	11·00	Written off in Conservator's R.Dis. No. 14900/56.D., dated 21st February, 1958. Cost of maintenance noted is for one year only.
16. Tanah shed	Do. ..	1920–21	394·00	4·00	Written off in District Forest Officer's R. Dis. No. 3128/55.D., dated 28th February 1958. Cost of maintenance noted is for one year only.
17. Tanah shed	Ambarampalayam ..	1957–58	370·43	..	Written off in District Forest Officer's D. Dis. No. 5635/60.D., dated 18th May, 1960.
18. Combined Forest Guards' and Watchers' Quarters (Villoni beat).	Angalakurichi ..	1959–60	5,137·00	15·00	Cost of maintenance noted is for three years only.
19. Combined Forest Guards' and Watchers' Quarters (Mankarai beat).	Do. ..	1959–60	6,154·00	15·00	Cost of maintenance noted is for three years only.

(b) STATEMENT OF BUILDINGS IN THE COIMBATORE SOUTH FOREST DIVISION—*cont.*

TUNACADAVU RANGE.

1. Forest Rest House with kitchen	Topslip	1926	15,914·37	334·15	Transferred to the Public Works Department as per G.O. Ms. No. 3124, Public Works Department, dated 4th November 1959. The cost of maintenance noted is up to 1959 only.
2. Servants' Quarters attached to the Forest Rest House.	Do. ..	1926	2,657·50	..	Not repaired during the last decade.
3. Motor garage attached to the Forest Rest House.	Do. ..	1926	1,907·31	..	Do.
4. Tunacadavu Range Office	Do. ..	1926	5,172·00	116·94	....
5. Range Officer's Quarters	Do. ..	1926	8,585·00	177·62	....
6. Servants' Quarters attached to Range Officer's Quarters.	Do. ..	1926	1,658·19	106·23	....
7. Assistant Range Officers' Quarters—Block I (2 sets).	Do. ..	1926	7,881·00	203·19	One wing of Assistant Range Officers' Quarters has been converted into non-residential building—*vide* G.O. Rt. No. 1404, Food and Agriculture, dated 28th August 1962—Presently being used as Veterinary Store Shed.
8. Assistant Range Officers' Quarters—Block II (2 sets).	Do. ..	1926	7,475·00	170·13	....
9. Range Clerk's Quarters	Do. ..	1926	7,630·00	224·95	....
10. Foresters' Quarters (3 sets)	Do. ..	1926	8,992·00	387·37	....
11. Forest Guards' Quarters (6 sets)	Do. ..	1926	6,731·00	322·60	....
12. Lineman's Quarters	Do. ..	1936–37	391·00	47·70	....
13. Engineering Range Officer's Quarters ..	Do. ..	1946–47	12,034·50	169·65	Converted as non-residential building in G.O. Ms. No. 2762, Food and Agriculture, dated 10th October 1957—Being used persently as Forest Dispensary.
14. Engineering Foresters' Quarters (two buildings).	Do. ..	1946–47	10,484·56	165·17	....
15. Engineering Peon's quarters	Do. ..	1947	3,006·62	33·75	....
16. Forester's Quarters No. I	Do. ..	1946–48	4,632·50	82·45	....
17. Forester's Quarters No. II	Do. ..	1946–48	4,769·00	117·90	....
18. Forester's Quarters No. III	Do. ..	1948–50	4,433·75	81·01	....
19. Motor Road roller shed	Do. ..	1948–49	317·00	78·25	Dismantled and reconstructed during 1960–61 at a cost of Rs. 400.
20. Store shed	Do. ..	1953–54	877·00	..	....
21. Shed for departmental lorry	Do. ..	1955–56	300·53	128·38	The average cost of maintenance is for eight years only.

(5) STATEMENT OF BUILDINGS IN THE COIMBATORE SOUTH FOREST DIVISION—*cont.*

Serial number and description.	*Locality.*	*Year of construction or purchase.*	*Cost of construction.*	*Average annual cost of maintenance for the period from 1953–54 to 1962–63.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)
		TUNACADAVU RANGE—*cont.*			
			RS. P.	RS. P.	
23. Forest Rest House	**Mount Stuart** ..	1885–86	3,001·00	601·20	Leased to the Gannon Dunkerley and Company (Private) Limited with effect from 1960. The average cost of maintenance noted is up to 1960 only.
24. Kitchen attached to the Rest House.. ..	Do. ..	1902	3,401·25	44·20	Do.
25. Fitter's Quarters	Do. ..	1903	2,001·50	185·75	Do.
26. Mazdoor line (2 blocks)	Anaigundi	1958–59	3,966·77	1,010·50	One building is intended for use as school for children of hill tribes and another as hostel for them (R. Dis. No. 10010/57.D.). The average cost of maintenance noted is for 2 years only.
27. Forester's Quarters	Do. ..	1958–59	3,024·90	396·00	The average cost of maintenance noted is for 3 years only.
28. Kitchen attached to Forester's Quarters ..	Do. ..	1958–59	1,159·28	..	....
29. Kraal (2 rooms)	Varagaliar ..	1957–58	5,821·00	137·00	....
30. Combined Range Office-*cum*-Range Officer's Quarters being used as Forest Rest House.	Palakadavu ..	1932–33	3,419·56	65·50	Proposed to be dismantled and reconstructed at Topslip during 1963–64 as the area gets submerged in the Parambikulam reservoir.
31. Range Clerk's and Peon's Quarters	Do. ..	1932–33	2,841·33	14·72	....
32. Forester's and Forest Guards' Quarters ..	Do. ..	1932–33	3,336·33	62·77	....
		PUNACHI RANGE.			
1. Grain Store (presently Attakatti Forester's Quarters).	Attakatti	1909–10	503·00	26·97	Acquired on 14th April 1932.
2. Post Office building (presently Attakatti Forest Guard's Quarters).	Do. ..	1918	3,687·00	19·01	Do.
3. Lineman's Quarters (presently Attakatti Reserve Watcher's quarters).	Do. ..	1923–24	614·31	38·32	Do.
4. Range Officer's quarters	Waterfalls	1927–28	4,673·00	74·62	....
5. Range Office and Range Clerk's Quarters ..	Do. ..	1928–29	2,424·00	57·23	....

(b) STATEMENT OF BUILDINGS IN THE COIMBATORE SOUTH FOREST DIVISION—*cont.*

Serial number and description.	*Locality.*	*Year of construction or purchase.*	*Cost of construction.*	*Average annual cost of maintenance for the period from 1953–54 to 1962–63.*	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)
		PUNACHI RANGE—*cont.*			
			RS. P.	RS. P.	
6. Forester's and Peon's Quarters	Water falls	1928–29	2,154·00	59·27	....
7. Forest Guard's Quarters (Semi-permanent)	**Iyerpadi**	1951–52	569·00	9·00	....
8. Forest Guard's quarters	Do.	1957–58	3,363·09	13·00	....
9. Combined quarters for **Forest Guard and** Reserve Watcher.	**Akkamalai**	1961–63	11,075·83	..	....
10. Forest Guard's Quarters	**Cinchona**	1960–61	3,969·00	10·00	....
11. Inspection Shed	**Konalar**	1956–58	3,490·23	129·19	Converted as residential building in G.O. Rt. No. 1792, Food and Agriculture, dated 7th October 1961—presently being used as mazdoor shed.
		UDUMALPET RANGE.			
1. **Range Officer's quarters and office**	**Udumalpet**	1892	3,538·79	410·96	Acquired from Judicial Department
2. Range Clerk's Quarters	Do.	1952–53	6,423·56	181·37	Constructed by the District Board Coimbatore.
3. Range Peon's Quarters	Do.	1952–53	4,223·56	79·24	....
4. Forest Rest House with kitchen	**Easalmanthorai**	1890–91	1,412·00	118·14	....
5. Servant's Quarters attached to **Rest House.**	Do.	1893–94	534·00	..	**No repairs** were **effected during the last decade.**
6. Stable attached to Rest House	Do.	1894–95	115·00	..	Do.
7. Sub-lines (5 sets)	Do.	1921	3,231·00	72·35	....
8. Sub-lines	**Karattur**	1930–31	2,248·00	184·62	....
9. Sub-lines	**Manupatti**	1931	2,495·00	243·64	....
10. Watcher's Quarters	Do.	1958–59	2,787·00	150·49	....
11. Inspection shed and additions (presently quarters of Forest Guard, Kallapuram).	**Kallapuram**	1895–96	897·00	72·60	**Converted as residential quarters in G.O. Rt. No 311, Food and Agriculture, dated 2nd March 1963.**
12. Forest Rest House with servant's line and stable.	**Manthorai**	1911–12	2,778·00	43·50	**Maintained for two years only. Transferred to the Amaravathi Reservoir Project Division, Public Works Department on 24th March 1958, as per G.O. No. 13551, o.iv/58-1, Food and Agriculture, dated 4th February 1958.**

13. Forest Rest House with additions	Kombu	1895–96	2,150·00	..	Handed over to the Public Works Department as per G.O. No. 413, Food and Agriculture, dated 14th February 1955.
14. Servant's Quarters (2 rooms, 2 stables) ..	Do. ..	1902–03	453·00	..	Do.
15. Forest Rest House	Amaravathinagar	1954	5,064·00	..	Constructed by the Public Works Department and handed over to the Forest Department in 1954 in exchange with the Kombu Rest House which was submerged in the Amaravath reservoir. Not repaired since taken over from the Public Works Department.
16. Sub-lines	Thalinji	1913	916·00	..	Not being maintained.

POLLACHI TIMBER DEPOT.

1. Depot Office building	Pollachi	1901–02	796·00	146·18	....
2. Zinc shed occupied by Depot Range Officer as residence.	Do.	1911–12	804·66	40·87	....
3. Compound wall constructed around Pollachi Timber Depot.	Do.	1955–56	8,747·00	96·69	....
4. Saw Mill Shed (Engine shed)	Do.	1926–27	3,569·00	..	Written off in G. O. Ms. No. 1216, Development, dated 31st October 1956.
5. Dump shed	Do.	1926–27	1,231·00	..	Do.

(c) STATEMENT OF WELLS, TANKS, ETC., IN THE COIMBATORE SOUTH FOREST DIVISION.

POLLACHI RANGE.

1. Big well in Range Office compound ..	Anamalai Farm ..	1923	1,768·00	..	Acquired from the Agricultural Department. Not repaired since 1931 as the well is not being used.
2. Irrigation channel and aqueduct	Anamalai Farm ..	1923	510·00	..	Not maintained.
3. Drag well in Range Office compound ..	Anamalai Farm ..	1927	245·00	16·21	..
4. Well at Sethumadai Colony	Sethumadai ..	Not known.	300·00	32·49	....
5. Well attached to sub-lines	Thulukkamadai ..	1921–22	249·50	..	Not repaired since 1949–50 as the well is not being used.
6. Well attached to sub-lines	Angalakurichi ..	1960–61	1,084·00	11·50	..

(c) STATEMENT OF WELLS, TANKS, ETC., IN THE COIMBATORE SOUTH FOREST DIVISION—*cont.*

Serial number and description. (1)	*Locality.* (2)	*Year of construction or purchase.* (3)	*Cost of Construction.* (4) RS. P.	*Average annual cost of maintenance for the period from 1953–54 to 1962–63.* (5) RS. P.	*Remarks.* (6)
		TUNACADAVU RANGE.			
1. Spring	Topslip	1925–26	1,998·44	50·59	....
2. Karianshola reservoir with pipe-line	Topslip	1927–28	14,483·53	206·25	The headworks were transferred to Kerala State on 1st November 1956 following "States Re-organisation" as this portion lies in the Thekkadi leased forests. Since water from this reservoir is still being utilised by the residents of Topslip, it continues to be maintained by this department. No repairs effected since 1958–59
3. Well with force pump and pipe-line	Mount Stuart	1923–33	602·20	13·37	No repairs were effected by the Department since 1961–62, as it is being maintained by the Gannon Dunkerley and Company (Private), Limited, who have taken the buildings at Mount Stuart on lease.
4. Well	Palakadavu	1936–37	594·00	..	Not maintained. The well gets submerged in the Parambikulam reservoir.
5 Pipe-line to Quarters	Palakadavu	1936–37	184·06	..	Do.
6. Well	Anaigundi	1959–60	4,000·00	188·50	Cost of repairs for two years only.
		UDUMALPET RANGE.			
1. Well inside Range Office Compound	Udumalpet	1892	1,171·00	25·37	Acquired from the Judicial Department.
2. Hand pump attached to well inside the Range Office compound.	Udumalpet	1939–40	202·94	..	Not being used.
3. Well attached to Easalmanthorai Rest House.	Easalmanthorai	Not known.	173·44	35·00	Repairs done during 1962–63 only.
4. Bore well attached to sub-lines	Manupatti	1939–40	249·00	60·62	Cost of repairs for one year only. Not maintained since 1955–56, as it is not being used.

Well attached to sub-lines	Manupatti	1962-63	1,472·05	..	....
Well inside the Thalavoipattanam Reserved Forest.	Thalavoipattanam ..	Not known	827·00	..	No repairs effected.

POLLACHI TIMBER DEPOT.

Well inside depot compound	Pollachi	1923-25	299·75	26·30	....

(d) STATEMENT OF RAIN-GUAGES IN THE COIMBATORE SOUTH FOREST DIVISION.

Serial number and location.	*Year of construction or acquisition.*	*Cost of construction.*	*Average annual cost of maintenance for the period from 1953-54 to 1962-63.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)
		POLLACHI RANGE.		
			RS. P.	
1. Sethumadai	1891 ..	Not known	5 67	....
		TUNACADAVU RANGE		
1. Topslip	1927 ..	Not known	..	Not repaired during the last decade.
2. Varagaliar	1958 ..	Not known	..	Not repaired so far.
		PUNACHI RANGE		
3. Waterfalls	Not known ..	Not known	..	Not repaired during the last decade.
		UDAMALPET RANGE		
4. Eesalmeenthorai	1903 ..	Not known	..	Not repaired during the last decade.

SECTION 6—PAST YIELD.

486. The following statement exhibits the past yield from the Coimbatore South Forest Division from 1952–53 to 1962–63.

(a) *Statement showing the yield of timber in the Coimbatore South Forest Division from 1952–53 to 1962–63.*

Year.	*Range.*	*Timber in cubic metres.*				*Poles in number.*	*Remarks.*
		Teak.	*Rose wood.*	*Soft wood.*	*Miscellaneous species.*		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1952–53	Pollachi	..	..	..	..	..	
	Tunacadavu	..	..	..	..	9,588	Particulars of timber yield from the Tunacadavu Range are not available. In the other ranges there was no yield of timber.
	Punachi	..	..	..	..	..	
	Udamalpet	..	..	..	..	..	
	Total	..	..	..	..	9,588	
1953–54	Pollachi	..	..	..	..	..	Particulars of timber yield from the Tunacadavu Range are not available. In the other ranges there was no yield of timber.
	Tunacadavu	..	..	..	..	1,137	
	Punachi	..	..	..	..	1,575	
	Udamalpet	..	..	..	..	—	
	Total	..	..	..	..	2,712	
1954–55	Pollachi	..	..	..	11·47	..	
	Tunacadavu	897·82	173·19	..	1,656·99	20,856	
	Punachi	..	..	..	..	500	
	Udamalpet	..	..	..	..	—	
	Total	897·82	173·19	..	1,668·46	21,356	
1955–56	Pollachi	..	..	205·75	166·19	..	
	Tunacadavu	2,610·70	117·97	..	2,204·38	9,833	
	Punachi	..	..	..	..	68	
	Udamalpet	..	..	..	125·73	..	Includes yield from Amaravathi submergible areas.
	Total	2,610·70	117·97	205·75	2,496·30	9,901	
1956–57	Pollachi	..	..	..	476·66	..	
	Tunacadavu	456·13	30·53	..	1,280·88	8,063	
	Punachi	..	..	..	..	..	
	Udamalpet	..	..	..	..	..	
	Total	456·13	30·53	..	1,757·54	8,063	

1957–58	Pollachi	..	..	..	230·58	..	
	Tunacadavu	468·93	23·14	554·81	1,267·43	861	
	Punachi	470·01	47·01	2·27	283·17	..	
	Udamalpet	..	..	..	..	..	
	Total ..	938·94	70·15	557·08	1,781·18	861	
1958–59	Pollachi	..	..	..	20·39	..	
	Tunacadavu	537·43	10·79	824·17	704·44	518	
	Punachi	135·04	50·15	..	620·74	2,419	
	Udamalpet	..	..	..	..	..	
	Total ..	672·47	60·94	324·17	1,345·57	2,937	
1959–60	Pollachi	..	..	..	59·52	..	
	Tunacadavu	282·83	60·12	703·20	2,061·12	768	
	Punachi	434·95	100·81	..	398·93	1,708	
	Udamalpet	..	..	..	..	..	
	Total ..	717·78	160·93	703·20	2,519·57	2,476	
1960–61	Pollachi	..	..	..	56·55	..	
	Tunacadavu	416·65	212·32	122·67	3,334·76	220	
	Punachi	306·42	33·73	..	420·22	5,580	
	Udamalpet	..	..	..	..	..	
	Total ..	723·07	246·05	122·67	3,811·53	5,800	
1961–62	Pollachi	..	..	..	94·95	..	
	Tunacadavu	269·27	123·43	208·41	4,544·76	450	
	Punachi	203·03	47·06	15·89	329·64	1,207	
	Udamalpet	..	..	..	..	..	
	Total ..	472·30	170·49	224·30	5,069·35	1,657	
1962–63	Pollachi	..	..	22·09	303·50	..	Includes yield from Aliyar submergible areas.
	Tunacadavu	259·86	46·02	..	2,211·43	2,793	
	Punachi	162·28	27·72	..	103·39	1,097	
	Udamalpet	..	..	..	..	..	
	Total ..	422·14	73·74	22·09	2,618·32	3,895	

(b) STATEMENT SHOWING THE YIELD OF FUEL IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952–53 TO 1962–63.

Range.	*Yield in metric tonnes.*											*Remarks,*
	1952–53	1953–54	1954–55	1955–56	1956–57	1957–58	1958–59	1959–60	1960–61	1961–62	1962–63	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Pollachi ..	..	832·19	3,673·20	5,485·92	3,156·01	1,968·19	1,483·51	3,274·89	3,584·96	1,533·30	5,769·42	
Tunacadavu ..	..	..	..	..	..	..	..	..	2,055·57	4,348·70	2,141·94	
Punachi ..	..	..	..	..	..	855·23	673·67	161·56	3,577·68	3,727·06	5,791·77	
Udamalpet ..	..	..	..	..	..	1,673·52	1,635·92	1,697.90	1,711·11	1,718·23	984·60	
Total ..	665·55	912·46	3,673·20	5,485·92	3,156·01	4,496·94	2,793·10	5,134·35	10,929·32	11,227.29	14,687·73	

STATEMENT SHOWING THE YIELD OF BAMBOOS IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952–53 TO 1962–63.

Year.	*Range.*		*Big Bamboos.*	*Small Bamboos.*	*Pachi.*	*Valkol.*	*Vettukai.*	*Valai.*	*Dabbai.*	*Kadai pootu.*	*Odai.*	*Dead Bamboos.*	*Marsumai or thorns.*
			NUMBERS.	NUMBERS.	NUMBERS.	NUMBERS.	NUMBERS.	NUMBERS.	NUMBERS.	NUMBERS.	NUMBERS.	NUMBERS.	BUNDLES.
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1952–53 ..	Pollachi ..	..	18,237	13,033	..	..	..	..	..	..	..	..	..
	Tunacadavu	..	..	..	..	3,865	9,914	1,600	3,066	..	671	..	80
	Punachi ..	..	..	..	..	..	..	..	..	..	..	..	..
	Udamalpet	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	18,237	13,031	..	3,865	9,914	1,600	3,066	..	671	..	80
1954–55	Pollachi ..	..	9,545	2,900	..	..	..	..	500	..	..	..	..
	Tunacadavu	..	1,07,386	22,246	3,150	64,428	94,061	..	19,599	..	..	..	2,313
	Punachi ..	..	..	..	..	..	..	..	..	..	..	..	..
	Udamalpet	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	1,16,931	25,146	3,150	64,428	94,061	..	20,099	..	..	..	2,313
1955–56	Pollachi ..	..	9,886	58,875	..	..	..	..	29,780	..	..	..	..
	Tunacadavu	..	..	..	..	400	600	..	59,534	8,857	1,11,296	..	..
	Punachi ..	..	..	..	..	8,540	1,634	..	709	..	3,347	..	..
	Udamalpet	..	..	..	..	..	16,862	..	..	..	..	..	..
	Total	..	9,886	58,875	..	8,940	18,596	..	90,023	8,357	1,14,642	..	..
1956–57	Pollachi ..	..	24,070	27,889	..	..	..	..	10,119	..	..	..	..
	Tunacadavu	..	2,20,382	1,16,896	3,078	3,503	660	70	54,755	..	1,805	..	2,476
	Punachi	..	7,000	1,230	..	..	..	..	..	..	..	..	..
	Udamalpet	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	2,51,452	1,46,015	3,078	3,503	660	70	64,874	..	1,805	..	2,476
1957–58	Pollachi ..	..	18,304	44,225	..	..	..	..	5,194	..	..	..	..
	Tunacadavu	..	23,410	2,95,626	..	..	..	..	60,290	..	..	..	250
	Punachi ..	..	..	..	..	..	..	..	..	..	..	..	..
	Udamalpet	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	41,414	3,39,845	..	..	..	..	65,484	..	..	..	250
1958–59	Pollachi	..	8,567	12,076	..	..	..	..	..	..	..	..	..
	Tunacadavu	..	29,795	67,740	..	..	..	..	17,115	..	..	40,287	6,025
	Punachi	..	..	..	..	..	..	..	..	..	..	..	..
	Udamalpet	..	..	..	..	..	..	..	.	..	..	..	..
	Total	..	38,362	79,816	..	..	..	..	17,115	..	..	40,237	6,025

STATEMENT SHOWING THE YIELD OF BAMBOOS IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952–53 TO 1962–63—*cont.*

Year.	Range.	*Big bamboos.* NUMBERS.	*Small bamboos.* NUMBERS.	*Puchi.* NUMBERS.	*Valkol.* NUMBERS.	*Vettukai.* NUMBERS.	*Valai.* NUMBERS.	*Dabbai.* NUMBERS.	*Kadai pootte.* NUMBERS.	*Odai.* NUMBERS.	*Dead bamboos.* NUMBERS.	*Marasmai or thorns.* BUNDLES.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1958–59 ..	Pollachi	20,060	6,296	3,410	4,250	1,300	449	..	..	3,240	30,483	45
	Tunacadavu ..	7,23,551	86,440	..	..	..	..	56,371	..	..	..	5,895
	Punachi ..	..	..	..	..	..	..	..	..	..	..	..
	Udumalpet ..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	7,43,611	92,736	3,410	4,250	1,300	449	56,371	..	3,240	30,483	5,940
1959–60 ..	Pollachi	20,744	1,15,982	30,395	2,800	520	372	400	..	..	..	..
	Tunacadavu ..	4,20,217	92,930	..	..	..	..	97,029	..	..	..	..
	Punachi	..	..	..	..	..	..	..	..	..	..	..
	Udumalpet	..	..	..	..	..	..	..	..	..	..	..
	Total ..	4,40,961	2,08,912	30,395	2,800	520	372	97,429	..	..	..	..
1960–61 ..	Pollachi	24,312	38,242	..	450	..	..	1,98,950	..	..	..	20,400
	Tunacadavu	4,92,092	..	..	..	..	..	..	..	..	..	..
	Punachi	20,615	15,216	..	..	..	..	2,045	..	..	..	..
	Udumalpet	15,396	..	812	218	..	..	..	..	..	..	..
	Total ..	5,52,415	53,458	812	668	..	..	2,00,995	..	..	..	20,400
1961–62	Pollachi	80,635	37,635	..	..	..	..	36	..	..	..	..
	Tunacadavu	5,19,660	..	..	..	..	..	1,04,503	..	..	10,288	2,076
	Punachi	..	..	..	..	..	..	..	..	..	..	..
	Udumalpet	..	400	..	..	..	..	..	..	..	..	..
	Total ..	6,00,295	38,035	..	..	..	..	1,04,596	..	..	10,288	2,076
1962–63 ..	Pollachi	73,432	..	23,170	2,800	..	..	1,259	..	650	..	..
	Tunacadavu	5,40,688	..	..	..	..	..	..	..	..	22,049	2,322
	Punachi	..	..	..	..	..	..	..	..	..	..	..
	Udumalpet	..	..	..	..	..	..	..	..	..	..	..
	Total ..	6,14,120	..	23,170	2,800	..	..	1,259	..	650	22,049	2,322

(d) STATEMENT SHOWING THE YIELD OF MINOR FOREST PRODUCE IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952-53 TO 1962-63.

Range. (1)	*Shekoy.* (2)		*Soapnut.* (3)		*Mangoes.* (4)		*Sundakai.* (5)		*Nellikai.* (6)		*Vilankai.* (7)	*Kilakai.* (8)		*Tamarind.* (9)		*Plantain leaves.* (10)		*Korai grass.* (11)		*Eacham grass.* (12)	
	M.T.	KG.	M.T.	KG.	M.T.	KG.	M.T.	KG.	M.T.	KG.		M.T.	KG.	M.T.	KG.	M.T.	KG.	M.T.	KG.	M.T.	KG
Pollachi	1	157	10	712	16	798	1	179	25	571	..	10	605	1,165	924	26	880	3	749	65	39
Tunacadavu	106	703	0	217	..		0	13	..		..	..		..		..		..		0	350
Punachi	1	80	1	588	0	817	..		..		..	..		..		4	190	..		..	
Udumalpet	0	127	15	952	14	872	..		9	437	..	0	356	8	509	..		0	470	276	54
Total..	109	67	28	469	32	487	1	192	35	008	..	10	961	1,174	433	30	107	4	218	342	788

Range. (1)	*Ginger.* (2)		*Canes.* (3)		*Black dammer.* (4)		*Peypodal.* (5)		*Honey.* (7)	*Wax.* (8)		*Gallnut.* (9)		*Avaram. bark.* (10)		*Rela bark.* (11)		*Korai kodi.* (11)	
	M.T.	KG.	M.T.	KG.	M.T.	KG.	M.T.	KG.	LITRES.	M.T.	KG.	M.T.	KG.	M.T.	KG.	M.T.	KG.	M.T.	KG.
Pollachi	2	181	7	223	4	380	57	245	292	0	57	21	517	46	555	31	120	..	
Tunacadavu	74	216	704	196	8	221	0	19	8,671	1	169	0	171	..		6	916	..	
Punachi	0	138	7	750	2	336	9	306	2,391	0	259	0	294	..		9	127	..	
Udumalpet	..		4	509	..		22	150	4,250	0	6	109	949	45	460	54	506	4	540
Total ..	76	535	723	668	14	887	88	720	5,635	1	485	131	931	92	015	101	669	4	540

Range. (1)	*Reeds.* (2)	*White dammer.* (3)		*Wax.* (4)		*Cardamom.* (5)		*Turmeric.* (6)		*Lemon grass oil.* (7)	*Euphorbia.* (8)		*Mahali kilangu.* (9)	
	NUMBERS.	M.T.	KG.	M.T.	KG.	M.T.	KG.	M.T.	KG.	LITRES.	M.T.	KG.	M.T.	KG.
Pollachi	..	..		..		0	4	..		818	..		67	277
Tunacadavu	38,262	6	557	0	287	7	833	1	653	..	..		..	
Punachi	5,22,811	..		..		..		..		..	..		..	
Udumalpet	..	..		..		..		..		38,241	103	192	0	381
Total ..	5,61,073	6	557	0	287	7	837	1	653	39,059	103	192	67	658

SECTION 5—PAST REVENUE AND EXPENDITURE

487. THE FOLLOWING STATEMENTS EXHIBIT THE REVENUE AND EXPENDITURE IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952–53 TO 1963–64.

(a) Statement of revenue realised in the Coimbatore South Forest Division from 1952–53 to 1962–63.

Year.	By Government Agency.				By Purchasers and Consumers.		
	Timber.	*Fuel.*	*Bamboos.*	*Other produce.*	*Timber.*	*Fuel.*	*Bamboo*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
			POLLACHI RANGE.				
1952–53	268 75	328 00	112 00	..	—	785 25	4,052 75
1953–54	..	255 62	..	..	2,347 87	10,353 00	1,727 00
1954–55	..	20 00	..	..	..	37,893 74	2,526 50
1955–56	..	115 00	..	..	..	39,044 62	2,084 00
1956–57	..	32 00	..	..	405 00	74,480 97	1,603 00
1957–58	1,996 17	43 50	..	..	3,408 00	62,287 92	48,007 00
1958–59	3,556 00	1,260 00	..	988 00	80 00	50,722 49	2,607 00
1959–60	..	—	..	..	..	80,968 00	5,664 25
1960–61	4,449 50	..	..	..	..	79,104 90	4,530 00
1961–62	17 50	..	..	..	..	77,759 00	19,300 00
1962–63	—	..	..	570 00	..	47,273 31	98,086 00

Year.	By Purchasers and Consumers.						
	Grazing and fodder grass.	*Minor Forest Produce.*	*Fines and for feitures.*	*Confiscated forest produce.*	*Rents.*	*Others.*	*Total.*
	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
1952–53	1,038 25	5,078 12	270 00	122 74	360 11	2,857 21	15,273 18
1953–54	3,207 00	3,362 50	295 00	133 73	365 98	1,973 07	23,960 77
1954–55	2,702 98	13,291 00	250 00	519 79	363 67	2,150 04	59,717 72
1955–56	3,152 87	5,077 50	375 00	137 23	408 62	3,157 97	53,552 81
1956–57	3,287 62	8,200 00	230 00	138 95	424 62	6,790 55	95,592 71
1957–58	2,599 40	5,501 22	475 00	505 61	447 97	6,923 37	1,27,195 16
1958–59	2,225 91	4,500 99	730 00	226 57	435 68	3,899 82	71,182 40
1959–60	2,216 84	7,001 57	208 50	104 45	440 97	2,353 32	98,957 90
1960–61	2,407 41	5,331 72	708 62	177 15	546 04	4,130 36	1,01,385 70
1961–62	2,535 92	9,500 00	..	77 47	445 90	2,276 34	1,11,912 18
1962–63	7,081 95	26,875 00	2,717 27	55 61	450 40	9,801 24	1,92,910 78

(a) Statement of revenue realised in the Coimbatore South Forest Division 1952–53 to 1962–1963—*cont.*

Year. (1)	*By Government Agency.* Timber. (2) RS. P.	Fuel. (3) RS. P.	Bamboos. (4) RS. P.	Other produce. (5) RS. P.	*By Purchasers and consumers.* Timber. (6) RS. P.	Fuel. (7) RS. P.	Bamboos. (8) RS. P.
TUNACADAVU RANGE.							
1952-53	6,75,619 96	..	..	..	..	..	16,716 50
1953-54	6,59,431 64	..	..	2,258 09	5,010 26	..	9,402 00
1954 –	6,15,407 05	..	..	2,78,628 70	..	..	19,362 22
1955-56	13,51,307 46	..	..	..	5,260 00	..	24,828 00
1956-57	11,19,872 84	..	..	..	..	53 00	35,541 56
1957-58	5,50,365 54	..	..	172 02	..	34,265 00	10,525 00
1958-59	5,92,013 34	..	..	..	1,274 00	..	34,401 00
1959-60	9,28,361 92	..	..	..	15,662 50	11,226 00	46,050 00
1960-61	6,55,010 44	7,010 00	..	7,780 00	51,758 56	7,900 00	61,271 00
1961-62	8,74,788 59	..	..	..	33,122 00	42,252 30	75,355 00
1962-63	6,44,185 78	35,570 39	..	..	..	33,122 00	56,880 00

Year.	*By purchasers and consumers.* Grazing and fodder grass. (9)	Minor Forest produce. (10)	Fines and for feitures. (11)	Confiscated forest produce. (12)	Remarks. (13)	Others. (14)	Total. (15)
1952-53	2 00	8,025 00	2,002 51	..	2,434 06	13,523 29	7,18,323 82
1953-54	12 00	2,661 60	70 00	..	2,391 16	3,085 93	6,84,322 08
1954-55	86 00	1,420 00	3,435 00	..	2,191 74	3,971 55	9,19,467 26
1955-56	..	1,050 00	1,307 31	..	2,215 62	2,578 06	13,88,546 45
1956-57	1,468 50	3,423 19	864 94	..	1,897 23	13,818 56	11,76,939 82
1957-58	..	3,368 00	200 00	..	1,858 66	3,906 38	6,04,660 60
1958-59	15 00	2,371 62	..	..	1,467 17	3,570 07	6,34,112 16
1959-60	19 00	2,396 00	5,804 50	..	1,244 57	6,575 71	10,17,340 20
1960-61	2 00	7,366 60	1,070 00	..	2,026 63	8,207 89	8,09,398 10
1961-62	11 50	4,946 50	..	..	2,164 88	..	10,85,210 66
1962-63	..	4,947 50	..	..	2,165 65	41,114 82	8,17,986 14

(a) **Statement of revenue realised in the Coimbatore South Forest Division from 1952-53 to 1962-63—*cont.***

Year. (1)	By Government Agency. Timber. (2) RS. P.	Fuel. (3) RS. P.	Bamboos. (4) RS. P.	Other produce. (5) RS. P.	By purchasers and Consumers. Timber. (6) RS. P.	Fuel. (7) RS. P.	Bamboos. (8) RS. P.
PUNACHI RANGE							
1952—53	1,087 43	814 00	152 75	—	26,963 50	720 47	288 75
1953—54	2,189 37	3,881 19	..	—	131 81	10 00	181 35
1954—55	..	1,541 56	..	—	199 36	900 00	179 75
1955—56	26,941 40	651 87	..	—	..	1,855 10	416 00
1956—57	70,087 74	..	..	—	8,693 50	953 37	..
1957—58	3,10,196 20	..	..	—	101 00	60,225 86	533 00
1958—59	43,982 75	..	..	—	95 00	86,988 11	..
1959—60	91,031 05	..	..	—	2,307 40	1,09,056 00	46,415 00
1960—61	3,05,009 47	..	..	..	1,181 57	93,187 00	22,490 00
1961—62	..	12,697 00	..	710 50	36,572 41	75,151 25	29,070 00
1962—63	3,310 00	..	..	4,304 35	36,000 00	2,19,287 67	..

By Purchasers and Consumers.

Year.	Grazing and fodder grass. (9)	Minor Forest Produce. (10)	Fines and for feitures. (11)	Confiscated Forest Produce. (12)	Remarks. (13)	Others. (14)	Total. (15)
1952—53	80 00	2,129 83	445 50	11 24	258 31	2,205 59	35,152 37
1953—54	3,325 00	1,492 65	..	8 28	319 43	2,526 17	14,065 10
1954—55	1,000 00	3,115 99	35 00	3 06	286 88	1,891 25	9,152 85
1955—56	150 50	6,770 38	..	44 62	273 81	2,411 93	39,515 61
1956—57	160 75	8,675 93	151 50	21 12	410 50	1,491 21	90,645 62
1957—58	146 00	7,415 85	266 25	155 64	323 44	3,716 75	8,83,079 99
1958—59	190 75	7,618 46	370 71	54 80	319 04	74,728 62	2,14,356 24
1959—60	424 50	12,032 25	129 67	72 30	167 50	2,576 50	2,64,212 17
1960—61	143 75	16,861 40	90 60	715 82	545 47	35,427 55	4,75,652 68
1961—62	142 40	3,207 00	..	31 25	689 72	3,529 61	1,61,801 14
1962—63	958 50	13,346 00	380 00	6 05	373 01	5,533 66	2,83,499 44

(a) Statement of revenue realised in the Coimbatore South Forest Division from 1952–53 to 1962–63—*cont.*

Year.	*By Government Agency.*								*By purchasers and Consumers.*					
	Timber.		*Fuel.*		*Bamboos.*		*Other produce.*		*Timber.*		*Fuel.*		*Bamboos.*	
(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
					Udumalpet Range.									
1952—53	2,133	43	22	00	—		..		4,788	44	10,723	74	1,554	18
1953—54	—		—		..		..		..		8,666	13	..	
1954—55	—		—		..		..		..		33,943	43	442	00
1955—56	—		—		—		—		—		26,383	99	..	
1956—57	—		—		—		..		—		9,900	30	..	
1957—58	—		—		—		..		..		19,089	59	100	00
1958—59	—		—		—		..		..		41,060	52	—	
1959—60	—		—		—		..		..		24,833	86	1,898	72
1960—61	—		5	00	..		..		..		38,521	63	880	00
1961—62	—		—		..		..		..		26,634	91	690	00
1962—63	—		—		..		2,944	00	..		29,725	00	..	

Year.	*By Purchasers and consumers.*													
	Grazing and fodder grass.		*Minor Forest Produce.*		*Fires and for feitures.*		*Confiscated Forest Produce.*		*Rents.*		*Others.*		*Total.*	
	(9)		(10)		(11)		(12)		(13)		(14)		(15)	
1952—53	410	00	1,084	75	231	00	50	21	194	31	3,887	45	25,079	91
1953—54	2,280	86	5,447	00	269	50	145	93	97	62	2,837	59	19,744	63
1954—55	2,622	99	5,786	50	1,499	12	202	61	122	68	3,267	10	47,886	43
1955—56	3,093	87	3,867	00	300	00	80	62	115	37	3,236	24	37,077	09
1956—57	3,461	62	5,381	50	1,105	00	109	17	160	00	3,111	97	23,229	56
1957—58	3,612	20	1,361	00	1,107	50	52	43	83	68	2,047	86	27,454	26
1958—59	3,522	84	8,603	84	54	50	147	19	242	34	3,150	05	56,781	28
1959—60	3,258	47	6,023	00	790	22	66	17	245	35	2,260	05	39,375	84
1960—61	3,086	07	7,073	00	600	00	58	59	232	90	1,603	54	52,060	73
1961—62	1,218	90	4,002	50	10	00	58	40	223	68	1,835	42	34,673	81
1962—63	3,612	64	7,852	05	500	41	31	38	242	70	3,318	43	48,256	61

(b) STATEMENT OF EXPENDITURE IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952–53 TO 1962–63.

Pollachi Range.

Year.	Departmental extraction and collection.		Cutting coupe lines and expenditure on B.I.B. timber.		Stores, feed, etc., of cattle (elephants.)		Roads.		Buildings.		Other works.		Fire protection.		Other works under organisation, improvement and extension of forests.	
(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1952—53	100	00	2,896	12	1,052	50	580	00	1,929	56	..		..		80	00
1953—54	9	00	3,087	69	100	00	3,677	69	1,243	68	160	00	..		1,045	76
1954—55	..		3,150	75	239	17	7,070	06	1,549	83	..		..		983	52
1955—56	..		3,225	88	892	62	4,859	50	1,617	34	205	50	..		1,003	54
1956—57	475	81	2,871	06	31	75	3,035	50	1,089	56	84	50	..		196	06
1957—58	429	30	3,413	09	..		4,625	89	1,516	95	..		..		602	14
1958—59	261	00	5,158	73	72	48	5,050	75	2,222	84	..		..		4,187	34
1959—60	90	00	4,844	89	1,129	89	2,024	20	1,648	62	..		..		2,226	24
1960—61	..		4,763	95	..		2,372	57	3,612	14	..		..		3,790	67
1961—62	297	72	5,504	44	52	50	752	54	2,491	62	..		..		1,873	92
1962—63	628	59	5,489	84	66	00	3,121	49	1,103	12	..		..		3,597	44

Year.	Miscellaneous.		Pay of establishment.		Travelling allowances and other compensatory allowances.		Contingencies.		Teak plantations.		Soft wood and match wood plantations.		Ex-Panchayat Forest.		Development schemes.		Total.	
	(10)		(11)		(12)		(13)		(14)		(15)		(16)		(17)		(18)	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1952—53	213	89	10,604	05	5,062	98	71	02	..		..		..		..		22,548	62
1953—54	156	31	6,237	44	5,157	17	33	78	..		..		..		..		20,907	52
1954—55	1,761	50	7,819	75	6,172	86	28	87	..		..		..		..		28,776	31
1955—56	100	78	8,373	81	6,120	15	12	53	..		152	00	..		..		26,264	65
1956—57	761	78	8,708	69	6,788	41	41	54	..		..		..		..		24,084	66
1957—58	..		7,312	76	7,633	95	31	61	..		..		..		..		25,595	69
1958—59	239	62	7,199	54	7,580	06	29	28	..		223	50	..		..		32,175	14
1959—60	3,140	97	8,068	05	9,446	98	42	60	..		..		..		..		32,662	44
1960—61	480	27	15,032	87	5,317	13	9	10	1,126	68	..		48	00	..		36,553	38
1961—62	784	82	14,143	03	4,969	62	40	02	1,218	14	..		..		..		33,127	87
1962—63	822	87	15,104	93	5,097	19	148	48	891	57	825	00	34	00	331	00	37,262	02

(b) STATEMENT OF EXPENDITURE IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952-53 TO 1962-63—*cont.*

Year.	Departmental extraction and collection.	Cutting coupe lines and expenditure on B.I.B. timber.	Stores, feed, etc., of cattle elephants.	Roads.	Buildings.	Other works.	Fire production.	Other works under organisation, improvement and extension of forests.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
				Tunacadavu Range.				
	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
1952—53 ..	.. ..	1,39,849 51	30 50	92,566 16	29,099 30	3,776 83	556 00	3,095 36
1953—54 ..	.. ..	1,19,125 51	91 50	73,462 71	23,986 57	5,225 69	386 50	3 935 74
1954—55 ..	.. ..	2,21,175 60	30 50	44,355 89	43,819 32	7,271 66	489 50	4,542 81
1955—56 ..	.. ..	1,11,601 96	155 50	47,098 23	40,701 95	3,728 63	2,062 74	4,933 87
1956—57 ..	.. ..	1,59,498 41	135 75	63,156 26	14,266 67	5,022 71	1,895 64	2,215 00
1957—58 ..	..	74,958 57	..	43,840 55	32,156 55	4,876 48	362 99	2,505 75
1958—59 ..	..	29,914 47	..	56,164 94	44,047 42	10,996 72	417 25	2,402 37
1959—60 ..	.. ..	61,780 71	21 00	43,911 13	37,511 06	13,595 14	5,745 84	2,383 00
1960—61 ..	.. ..	1,22,215 65	..	47,560 69	25,109 11	3,571 74	965 10	2,442 83
1961—62 ..	..	80,279 76	12,206 68	51,262 05	33,996 41	4,031 14	1,085 40	1,086 16
1962—63 ..	.. ..	1,15,213 97	1,573 24	60,550 00	49,783 93	26,226 07	1,153 78	2,694 00

Year.	Miscellaneous	Pay of establishment	Travelling allowances and their compensatory allowances.	Contingencies.	Teak plantations.	Soft wood and Match wood plantations.	Ex-Panchayat forest.	Development schemes.	Total.
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
1952—53 ..	12,060 43	59,197 28	19,689 47	8,549 30	..	..	..	..	3,77,694 30
1953—54 ..	11,432 75	31,231 03	18,781 98	7,634 33	..	..	..	..	3,09,380 80
1954—55 ..	13,478 56	32,884 72	18,644 29	5,361 20	..	..		..	4,12,409 00
1955—56 ..	6,668 05	33,587 55	17,854 19	1,701 42	..	..	..	..	2,71,449 52
1956—57 ..	7,862 18	26,156 54	16,016 14	5,814 32	..	..	..	..	3,11,761 83
1957—58 ..	14,134 13	21,164 67	15,987 07	3,279 14	..	..	..	..	2,19,581 96
1958—59 ..	3,313 78	16,175 08	14,827 69	1,496 50		..	..	..	1,82,779 59
1959—50 ..	8,152 89	16,355 92	15,870 54	2,873 98	..	..	..	..	2,11,168 25
1960—61 ..	16,469 10	26,038 51	11,872 21	1,516 52	1,165 12	..	..	..	2,63,356 65
1961—62 ..	4,254 78	26,024 29	9,271 84	1,441 58	7,381 97	..	..	..	2,37,213 42
1962—63 ..	12,323 97	24,665 27	10,161 02	1,779 16	1,356 59	..	..	..	3,28,490 48

(b) STATEMENT OF EXPENDITURE IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952-53 TO 1962-63—cont.

Punachi Range.

Year. (1)	*Departmental extraction and collection.* (2)	*Cutting coupe lines and expenditure on B.I.b. timber.* (3)	*Stores, feed, etc., of cattle (elephants).* (4)	*Roads.* (5)	*Buildings.* (6)	*Other works.* (7)	*Fire protection.* (8)	*Other works under organisation, improvement and extension of forests.* (9)
	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
1952–53 ..	197 75	1,122 39	1 12	1,224 82	1,230 63	61 00	..	1,085 06
1953–54 ..	3,336 49	1,804 62	..	363 56	351 32	2 00	664 25	4,142 74
1954–55 ..	5,392 62	1,064 60	..	330 75	207 00	13 75	596 61	1,387 46
1955–56 ..	47,212 87	1,106 31	56 89	584 00	773 25	10 00	354 00	3,072 99
1956–57 ..	50,224 87	1,149 12	31 24	330 19	745 06	108 12	336 37	540 50
1957–58 ..	72,650 00	1,422 49	16 00	846 50	1,542 07	377 00	293 87	1,056 23
1958–59 ..	5,408 62	2,474 79	..	15,311 85	663 25	..	585 85	1,892 03
1959–60 ..	65,563 62	69,681 89	107 99	25,805 33	2,207 85	..	846 37	4,003 78
1960–61 ..	1,26,851 93	2,007 62	45 00	16,734 61	269 10	667 50	521 00	3,784 06
1961–62 ..	9,511 90	2,652 60	..	13,762 42	944 21	1,000 00	828 00	3,786 11
1962–63 ..	1,81,519 31	2,564 50	10,104 21	46,227 63	2,673 66	4,571 52	742 84	15,728 68

Year.	*Miscellaneous.* (10)	*Pay of establishment.* (11)	*Travelling allowances and other compensatory allowances.* (12)	*Contingencies.* (13)	*Teak plantations.* (14)	*Softwood and matchwood plantations.* (15)	*Ex-Panchayat forests.* (16)	*Development schemes.* (17)	*Total.* (18)
	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
1952–53 ..	437 00	7,255 11	4,655 25	23 92	..	..	..	..	17,332 15
1953–54 ..	268 75	6,648 25	4,982 85	37 45	..	..	..	..	22,602 48
1954–55 ..	67 00	6,205 62	4,972 80	73 35	..	..	..	..	20,311 56
1955–56 ..	412 24	6,766 74	5,405 53	50 43	..	..	..	..	65,806 65
1956–57 ..	213 06	7,147 31	5,838 97	73 11	..	..	..	..	66,737 92
1957–58 ..	..	6,981 90	7,188 80	52 68	..	..	..	..	92,427 04
1958–59 ..	223 70	5,907 98	7,395 43	79 92	2,059 96	..	..	..	42,003 38
1959–60 ..	183 14	5,578 60	8,493 26	109 30	2,693 29	..	..	..	1,85,274 36
1960–61 ..	3,383 65	10,167 57	4,297 49	76 63	3,741 12	..	..	..	1,72,547 28
1961–62 ..	684 83	13,402 08	5,122 65	62 88	2,788 19	..	..	..	54,546 57
1962–63 ..	3,670 75	15,969 67	6,117 03	220 92	3,151 17	..	68 46	..	2,96,478 75

(b) STATEMENT OF EXPENDITURE IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952-53 TO 1962-63—*cont.*

Year.	Departmental extraction and collection.		Cutting coupe lines and expenditure on B.I.B. timber.		Stores, feed, etc., of cattle (elephants.)		Roads.		Buildings.		Other works.		Fire protection.		Other works under organisation, improvement and extension of forests.	
(1)	(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
Udumalpet Range.																
1952-53 ..	8	50	3,459	19	382	00	..		1,080	25	30	00	..		133	75
1953-54 ..	..		3,524	02	462	24	830	00	967	65	..		..		..	
1954-55 ..	477	00	3,311	05	..		4,448	00	1,450	59	..		..		9,685	80
1955-56 ..	..		3,574	18	178	62	591	00	669	88	72	25	..		54	00
1956-57 ..	..		3,471	43	42	24	969	50	4,349	88	2	25	..		..	
1957-58 ..	..		4,092	56	25	00	300	00	1,655	10	..		..		—	
1958-59 ..	..		6,456	75	..		293	00	4,482	97	212	00	..		877	55
1959-60 ..	..		5,379	50	15	00	239	50	897	91	100	00	..		8,047	07
1960-61 ..	..		5,507	55	111	06	—		3,327	45	90	00	..		2,857	34
1961-62 ..	20	36	6,469	84	..		..		2,248	04	..		..		1,196	76
1962-63 ..	1,470	77	5,888	35	256	72	120	00	2,681	56	537	31	..		2,196	12

Year.	Miscellaneous		Payment of establishment.		Travelling allowances and other compensatory allowances.		Contingencies.		Teak plantations.		Softwood and matchwood plantations.		Ex-Panchayat forests.		Development schemes.		Total.	
	(10)		(11)		(12)		(13)		(14)		(15)		(16)		(17)		(18)	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1952-53 ..	209	81	7,319	06	6,765	00	40	66	..		..		..		..		18,428	22
1953-54 ..	28	75	5,927	61	5,438	67	40	74	..		..		..		..		16,719	68
1954-55 ..	3,356	44	7,692	66	6,264	48	25	49	..		..		667	81	..		37,778	72
1955-56 ..	101	18	6,017	70	5,873	75	31	63	..		..		366	37	218	75	19,933	81
1956-57 ..	943	36	7,188	37	5,891	67	83	08	..		..		..		..		22,792	78
1957-58 ..	40	00	7,493	42	6,803	13	55	07	..		..		1,116	38	..		21,585	66
1958-59 ..	2,288	04	8,974	26	7,249	34	98	15	..		..		..		..		30,932	06
1959-60 ..	3,298	39	9,436	21	8,115	88	39	20	..		..		..		..		30,563	86
1960-61 ..	4,660	26	12,732	23	4,746	44	76	78	..		..		..		..		34,109	11
1961-62 ..	3,320	79	14,238	65	3,536	59	64	17	..		..		..		..		31,005	80
1962-63 ..	1,801	82	13,367	64	4,510	36	100	07	..		1,068	39	2,253	76	..		36,252	76

(b) STATEMENT OF EXPENDITURE IN THE COIMBATORE SOUTH FOREST DIVISION FROM 1952-53 TO 1962-63—*cont.*

Year. (1)	Departmental extraction and collection. (2) RS.	P.	Cutting coupe lines and expenditure on B.I.B. timber. (3) RS.	P.	Stores, feed, etc., of cattle (elephants.) (4) RS.	P.	Roads. (5) RS.	P.	Buildings. (6) RS.	P.	Other works. (7) RS.	P.	Fire protection. (8) RS.	P.	Other works under organisation, improvment and extension of forests. (9) RS.	P.
							Pollachi Timber Depot.									
1952-53 ..	765	00	..		..		157	50	61	00	..		..		..	
1953-54 ..	653	32	..		..		268	06	143	81	..		..		125	45
1954-55 ..	2,207	53	..		..		268	37	165	36	..		..		130	31
1955-56 ..	14,402	63	..		9	00	489	61	10,002	79	9	87	..		5	00
1956-57 ..	3,752	05	..		36	34	485	46	194	50	..		..		14	00
1957-58 ..	2,495	36	..		269	61	497	42	602	97	..		..		..	
1958-59 ..	48,900	19	..		..		380	00	387	72	..		..		..	
1959-60 ..	3,399	34	..		..		..		635	92	..		..		..	
1960-61 ..	31,884	00	..		7	00	..		470	28	..		..		..	
1961-62 ..	2,515	63	..		..		22	00	414	15	..		..		36	00
1962-63 ..	4,183	86	..		..		..		5024	78	..		15	00	106	00

Year.	Miscellaneous. (10) RS.	P.	Pay of establishment. (11) RS.	P.	Travelling allowances and other compensatory allowances. (12) RS.	P.	Contingencies. (13) RS.	P.	Teak plantations. (14) RS.	P.	Soft wood and matchwood plantations. (15) RS.	P.	Ex-Panchayat forests. (16) RS.	P.	Development schemes. (17) RS.	P.	Total. (18) RS.	P.
1952-53 ..	129	81	5,424	85	2,238	18	176	97	..		..		..		..		8,983	81
1953-54 ..	..		3,792	42	1,469	73	118	88	..		..		..		..		7,011	24
1954-55 ..	..		4,002	22	2,219	53	109	94	..		..		..		..		8,603	76
1955-56 ..	336	55	3,378	87	1,141	92	83	08	..		..		..		..		29,509	62
1956-57 ..	363	16	3,244	65	1,588	60	125	12	..		..		..		..		9,803	91
1957-58 ..	265	12	2,645	93	1,778	73	223	27	..		..		..		..		8,778	41
1958-59 ..	199	16	4,118	68	2,041	95	121	45	..		..		..		..		56,129	14
1959-60 ..	..		5,332	09	2,093	67	159	66	..		..		..		..		11,520	68
1960-61 ..	260	01	8,510	84	2,108	19	49	94	..		..		..		..		43,290	66
1961-62 ..	434	01	7,542	20	829	46	47	37	..		..		..		..		11,840	85
1962-63 ..	..		5,148	92	759	77	164	44	..		..		..		..		15,402	77

(*c*) Statement showing the financial position in the Coimbatore South Forest Division from 1952–53 to 1962–63.

Year. (1)	*Total revenue.* (2) RS. P.	*Total expenditure.* (3) RS. P.	*Profit.* (4) RS. P.	*Remarks.* (5)
1952–53	7,93,828·78	4,44,986·60	3,48,842·18	..
1953–54 ..	7,42,092·63	3,76,631·72	3,65,460·91	
1954–55	10,36,224·26	5,07,879·75	5,28,344·91	..
1955–56	15,186,91·96	4,20,963·15	10,97,728·81	..
1956–57	13,86,407·71	4,35,181·10	9,51,226·61	..
1957–58	11,42,390·01	3,67·978·76	7,74,411·25	..
1958–59	8,26,432·08	3,44,019·31	4,82,412 77	..
1959–60	14,19,886·11	4,71,199·59	9,48,686·52	..
1960–61	14,38,497·18	5,49,856·68	8,88,640·50	..
1961–62	13,93,520·24	6,01,955·51	7,91,564·73	..
1962–63	13,42,922·77	7,03,883·78	6,39,038.99	..

CHAPTER VI—STATISTICS OF GROWTH AND YIELD.

SECTION I.—STATISTICS RELATING TO DECIDUOUS TIMBER SPECIES.

488. *Rate of growth of natural teak in the Tunacadavu Range.*—H.F.A. Wood carried out ring countings on the stumps of 15 teak trees felled at Mount Stuart during the preparation of this working plan (1916–18). The following statement prepared from Wood's curve shows the relationship between age and girth in centimetres at breast height :—

Age in years. (1)	*Girth at breast height over-bark. Centimetres.* (2)
10	18
20	37
30	57
40	77
50	97
60	116
70	134
80	150
90	163
100	175
110	183
120	191
130	197
140	203
150	209
160	215
170	219
180	223
190	226
200	230

489. *Quality class mapping of teak plantations.*—All teak plantations over 10 years of age in the Tunacadavu Range (excepting those of the Palakadavu Block) have been stock-mapped in order to assess the area to be allotted to the different All-India Teak Site Quality Classes as per the 'Revised Yield and Stand Tables for Plantation Teak' (Indian Fore-Records-New Series, Volume 9. No. 4). The Palakadavu plantations were excluded from the scope of this work as bulk of the plantations formed in this valley have been clear-felled in order to accommodate the Parambikulam reservoir. The few areas left behind represent either failed portions with miscellaneous growth or patches of poor quality in the higher reaches. The Lower Punachi plantations were not stock-mapped as the general site quality in this area is below Quality IV.

190. The method of stock-mapping done in the Mount Stuart plantations is briefly described as under :—

A convenient base line was taken for each plantation and strips were cut at right angles to the base line at intervals of 3 chains. The tallest tree in each square chain on either side of the strip was then measured and pegged at each chain. The tallest tree in each square chain on either side of the strip was then measured thus securing the heights of the tallest trees in every square chain in two adjacent strips, omitting one intermediate strip. The tallest tree in every tenth square chain of the intermediate strip was also measured, the 5th, 15th, 25th, etc., squares being measured from one strip, and the 10th, 20th, 30th, etc., squares from the next strip and so on. Blanks, streams, inspection paths, swamps, failed patches and such other features were also marked while proceeding along each strip. The base and the strip lines were then plotted on graph paper and the height measurements were entered in the respective squares. The heights were then grouped together according to the quality classes shown against the age of the plantation in the 'Revised Yield and Stand Tables for Plantation Teak ', and coloured quality class maps were prepared in a scale of 12 inches to a mile (1 centimetre—.0528 kilometres). These quality class maps which have been appended to this plan will be found useful in assessing the proper espacement of stems at the time of thinning.

491. The statement given below shows the distribution of areas under each site quality class in the older teak plantations of Mount Stuart Block.

Year of planting.	*Compartments in which the plantation occurs.*	*Total area planted in hectares.*	*Area presently containing teak in hectares.*	*Areas falling under the different All India Site Quality classes.*					*Blanks. Hectares.*	*Swamps. Hectares.*	*Remarks.*
				I *Hectares.*	II *Hectares.*	III *Hectares.*	IV *Hectares.*	*Below IV. Hectares.*			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
1872	Mount Stuart 73	2·43	2·43	..	..	2·43	..	..	..	..	
1890	Mount Stuart 63	2·43	0·76	..	..	0·40	0·36	..	1·67	..	
1900	Mount Stuart 63	0·81	0·53	..	..	0·53	..	..	0·28	..	
1927	Mount Stuart 61,62	59·23	30·76	..	8·70	18·82	3·24	..	28·47	..	
1928 Bit I	Mount Stuart 64,65	29·76	18·01	..	1·66	12·14	4·21	..	11·75	..	
1928 Bit II	Mount Stuart 66,68,69	21·85	4·82	..	2·27	2·55	..	..	16·63	0·40	
1929 Bit I	Mount Stuart 69,72	16·19	10·00	..	..	7·53	2·43	0·04	6·19	..	
1929 Bit II	Mount Stuart 71,72	44·92	32·17	0·12	19·67	12·02	0·36	..	12·75	..	
1930 Bit I	Mount Stuart 73	25·39	18·42	0·53	13·76	4·05	0·08	..	6·97	..	
1930 Bit II	Mount Stuart 53,72	13·43	9·23	..	6·72	2·47	0·04	..	4·20	..	
1930 Bit III	Mount Stuart 72,73	7·20	3.95	..	0·89	3.06	..	..	3·25	..	
1930 Bit IV	Mount Stuart 72	12·42	9·47	..	5·87	3·60	..	..	2·95	..	
1930 Bit V	Mount Stuart 75	27·84	8·65	0·24	6·35	2·02	0·04	..	19·19	..	
1931	Mount Stuart 53	33·17	29·95	1·80	17·60	10·02	0·53	..	3·22	..	
1932	Mount Stuart 74,75	36·06	23·96	3·22	16·92	3·52	0·20	..	12·10	..	
1934	Mount Stuart 53,75	32·17	30·27	2·89	21·49	5·83	0·06	..	1·90	..	
1934 (P. S. plantation)	Mount Stuart 65	1·62	0·26	..	0·18	0·08	..	..	1·36	..	
1935	Mount Stuart 52,53	20·17	16·49	1·58	12·16	2·75	..	..	3·68	..	
1935 (Bungalow plantation)	Mount Stuart 63	2·02	0·77	..	0·04	0·73	..	..	1·25	..	
1936 (P. S. plantation)	Mount Stuart 65	2·02	2·02	..	0·24	1·74	0·04	..	..	..	
1937 (P. S. plantation)	Mount Stuart 65	2·02	0·55	..	..	0·55	..	..	1·47	..	
	Total ..	393·15	253·47	10·48	134·52	96·84	11·59	0·04	139·38	0 40	

492. *Diameter increment in teak Plantations of Tunacadavu Range.*—From the preceding statement, it will be seen that bulk of the teak plantations in the Tunacadavu Range fall under All India Site Quality II. The following statement shows the relationship between age and diameter for teak plantations of All India Site Quality II as given in the revised yield tables. This data is based on sample plots maintained all over India and thinned to a C grade. The corresponding figures for trees of Site Quality II in sample plots maintained near Topslip by the State Silviculturist and also thinned to a C grade are also given side by side. The district plantations have been generally thinned to an intensity of F grade. The comparison shows that even when subjected to the same grade of thinning, the rate of diameter growth of teak at Mount Stuart is much faster than the All India averages and is even more when thinned to a higher intensity.

Age in years.	*Average diameter at breast height in centimetres for Site Quality II.*		
	All India yield table figures.	*Sample plots.*	*District plantations.*
(1)	(2)	(3)	(4)
5	8	8	10
10	12	13	17
15	16	19	24
20	20	24	29
25	24	29	34
30	27	33	39
35	31	38	44
40	34	42	49
45	37	47	53
50	40	51	58
55	42	56	62
60	45	59	68
65	47	63	71
70	49	66	75
75	52	70	80
80	54	74	84

493. *Local out-turn tables for deciduous timber species.* Local out-turn tables for all the common deciduous timber species have been compiled by the writer in the metric system. Apart from teak and rosewood, about 24 deciduous species are presently saleable, but of these only about ten commonly occur in the forests. Out-turn tables have been prepared for each of these species from data based on local conversion practice in the clearfelling coupes of Ulandi and Palakadavu Blocks. The graphs have been based on data collected from 100 trees belonging to each girth class for each of these species.

Serial number and species.	*Volume in cubic metres for various girth classes in centimetres.*						
	90·1 to 120·0	120·1 to 150·00	150·1 to 180·0	180·1 to 210·0	210.1 to 240·0	240·1 to 270·00	270·1 to 300·0
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. Tectona grandis	0·40	0·80	1·25	1·77	2·46	3·25	4·00
2. Dalbergia latifolia	0·25	0·50	0·80	1·28	1·78	2 40	3·03
3. Tarminalia paniculata	0·35	0·58	0·85	1·18	1·57	2·0	2·60
4. Terminaiia tomentosa	0.33	0·55	0·86	1·24	1·70	2·28	2·97
5. Lagerstroemia lanceolata	0·45	0 77	1·15	1·56	2·10	2·67	3·20
6. Grewia tiliaefolia	0·39	0 57	0·80	1·08	1·40	1·80	2·20
7. Albizzia odoratissima	0·36	0·60	0.90	1·26	1·78	2 42	2·95
8. Cordia dichotoma	0·20	0·40	0 67	0·98	1·36	1·80	2.37
9. Radermachera xylocarpa	0·24	0·40	0·69	1·03	1·46	1·90	2·34
10. Pterocarpus marsupium	0·28	0 45	0·72	1·00	1·32	1·70	2·15
11. Adina cordifolia	0·29	0·49	0·83	1·20	1·08	2·27	2·90
12. Mitragyna parvifolia	0 30	0·58	0·88	1·26	1·74	2·30	2·55

494. *Partial enumeration of areas included in the Teak Plantation Working Circle.*—A ten per cent sampling of the areas proposed for clearfelling and planting with teak in the Mount Stuart Block was made in order to assess the probable yield. The Mount Stuart Block has already been divided into permanent compartments in the preparation of previous working plans. There is also little variation in species composition or canopy density in this block. The enumerations were therefore carried out by the method of 'systematic strip sampling'. However, a randomised start was adopted in the selection of strips that were to be enumerated. The enumeration technique is briefly described below :

495. A base line, 1 metre wide was run across the fertility gradient along the longest side of each compartment. The line was surveyed and numbered pegs were driven into **the** ground at intervals of one chain. Enumeration was to be done in one chain wide **strips** taken at right angles to the base line at intervals of every ten chains. The strip **from** which the enumeration was to be commenced was decided by lots to avoid **objections of any bias.** For instance if it was decided to start enumeration from the 3rd strip in any particular compartment, strip lines one metre wide were cut at right angles to the base line at every 3rd, 13th, 23rd, etc., pegs and all trees belonging to certain species above a breast height girth of 90 centimetres were enumerated to a width of half a chain on either side of the strip line. The enumeration was conducted in 30 centimetres girth classes.

496. The species enumerated were: *Tectona grandis, Dalbergia latifolia, Terminalia paniculata, Terminalia tomentosa, Grewia tiliaefolia, Lagerstroemia lanceolata, Cordic, dichotoma, Albizzia odoratissima, Radermachera xylocarpa, Mitragyna parvifolia, Vitex altissima, Stereospermum personatum, Terminalia belerica, Schleichera oleosa, Gmelina arborea, Machilus macrantha and Dillenia pentagyna.*

497. The results of enumeration over each compartment are tabulated in the following statements.—

Species.	*Girth classes in centimetres.* 91–120	121–150	151–180	181–210	211–240	241–270	271–300	*Above* 300	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

Compartment :—**Mount Stuart 52.** **Area of compartment included in the working circle and proposed for conversion**—33·63 **hectares.**

Toctona grandis	..	..	..	1	..	..	1	1	3
Terminalia paniculata	1	1	1	1	1	1	1	2	9
Terminalia tomentosa	..	1	..	..	1	1	..	..	3
Grewia tiliaefolia	5	6	6	5	4	3	2	2	33
Lagerstroemia lanceolata	4	3	4	3	2	1	2	1	20
Cordia dichotoma	2	1	1	..	1	..	..	..	5
Albizzia odoratissima	1	1	1	1	1	..	..	..	5
Radermachera xylocarpa	1	1	..	..	..	..	..	..	
Vitex altissima	1	..	..	..	..	..	..	..	1
Gmelina arborea	1	—	..	..	..	..	..	..	1
Machilus macrantha	1	1	..	..	..	..	..	..	2

Compartment ;—**Mount Stuart 65** **Area of compartment included in the working circle and proposed for conversion**—38.35 **hectares.**

Delbergia latifolia	..	1	..	..	..	..	..	..	1
Terminalia paniculata	1	1	1	1	1	1	1	2	9
Terminalia tomentosa	..	1	1	..	..	..	..	..	2
Grewia tiliaefolia	6	7	7	5	5	3	2	1	36
Lagerstroemia lanceolata	5	3	5	3	3	1	2	1	23
Cordia dichotoma	2	1	1	..	1	..	..	..	5
Albizzia ordoratissima	1	1	1	1	1	..	..	..	5
Radermachera xylocarpa	1	1	..	..	..	..	..	..	2
Vitex altissima	1	..	..	..	..	..	..	..	1
Gmelina arborea	1	..	..	..	..	..	..	..	1
Machilus macrantha	2	..	..	..	..	..	..	..	2

Compartment ;—**Mount Stuart** 66 **Area of compartment included in the working circle and proposed for conversion**—77·28 **hectares.**

Dalbergia latifolia	1	1	..	1	..	..	..	2	5
Terminalia paniculata	2	2	2	3	1	2	2	4	18
Terminalia tomentosa	..	1	..	1	..	1	1	1	5
Grewia tiliaefolia	12	15	15	11	9	7	1	..	70
Lagerstroemia lanceolata	10	6	9	6	5	2	4	3	45
Cordia dichotoma	4	2	2	1	2	..	..	..	11
Albizzia odoratissima	1	2	2	2	3	1	..	1	12
Radermachera xylocarpa	2	1	1	1	..	..	..	..	5
Mitragyna parvifolia	1	1	..	..	..	..	..	..	3
Vitex altissima	2	1	..	..	..	..	..	..	3
Gmelina arborea	1	1	1	..	..	..	..	..	2
Sterespermum personatum	1	1	..	..	..	..	..	..	2
Machilus macrantha	3	1	1	..	..	..	..	..	5
Terminalia belerica	..	..	..	..	..	..	..	1	1
Shleishera oleosa	..	1	..	..	..	..	..	..	1
Dillenia pentagyna	1	..	..	..	..	..	..	..	1

Girth classes in centimetres.

Compartment:—Mount Stuart 68

Area of compartment included in the working circle and proposed for conversion—28·02 hectares.

Species. (1)	91–120 (2)	121–150 (3)	151–180 (4)	181–210 (5)	211–240 (6)	241–270 (7)	271–300 (8)	*Above* 300 (9)	*Total.* (10)
Dalbergia latifolia	..	1	..	..	..	..	..	..	1
Terminalia paniculata	1	1	1	1	..	1	1	1	7
Terminalia tomentosa	1	1	..	..	..	..	..	..	2
Grewia tiliaefolia	4	5	5	4	3	3	2	1	27
Lagerstroemia lanceolata	4	2	3	2	2	1	1	..	15
Cordia dichotoma	1	1	1	..	1	..	..	..	4
Albizzia odoratissima	..	1	1	1	1	..	..	..	4
Radermachera xylocarpa	1	..	..	..	..	..	..	..	1
Vitex altissima	1	..	..	..	..	..	..	..	1
Gmelina arborea	1	..	..	..	..	..	..	..	1
Machilus macrantha	1	..	..	..	..	..	..	..	1

Compartment:—Mount Stuart 69

Area of compartment included in the working circle and proposed for conversion—1·25 hectares.

Species. (1)	91–120 (2)	121–150 (3)	151–180 (4)	181–210 (5)	211–240 (6)	241–270 (7)	271–300 (8)	*Above* 300 (9)	*Total.* (10)
Terminalia paniculata	1	1	..	1	1	..	..	..	4
Grewia tiliaefolia	1	1	1	1	..	..	..	..	4
Lagerstroemia lanceolata	1	..	1	..	..	..	..	..	2

Compartment:—Mount Stuart 70.

Area of compartment included in the working circle and proposed for conversion—55·69 hectares.

Species. (1)	91–120 (2)	121–150 (3)	151–180 (4)	181–210 (5)	211–240 (6)	241–270 (7)	271–300 (8)	*Above* 300 (9)	*Total.* (10)
Dalbergia latifolia	1	1	..	..	..	..	..	1	3
Terminalia paniculata	2	2	1	2	1	1	1	3	13
Terminalia tomentosa	..	1	..	..	..	..	1	1	3
Grewia tiliaefolia	9	11	11	8	7	5	3	3	57
Lagerstroemia lanceolata	7	5	7	4	2	3	1	1	30
Cordia dichotoma	3	2	1	1	1	..	..	..	8
Albizzia odoratissima	1	1	1	1	2	1	..	..	7
Radermachera xylocarpa	2	1	..	..	..	..	..	..	3
Vitex altissima	1	..	..	..	..	..	..	..	1
Stereospermum personatum	..	1	..	..	..	..	..	..	1
Gmelina arborea	1	1	1	..	..	..	..	..	3
Machilus macrantha	2	1	1	..	..	..	..	..	4

Compartment;—Mount Stuart 71

Area of compartment included in the working circle and proposed for conversion—45·12 hectares.

Species. (1)	91–120 (2)	121–150 (3)	151–180 (4)	181–210 (5)	211–240 (6)	241–270 (7)	271–300 (8)	*Above* 300 (9)	*Total.* (10)
Dalbergia latifolia	1	1	..	..	..	..	..	1	3
Terminalia paniculata	1	2	1	2	1	1	1	3	12
Terminalia tomentosa	..	1	..	..	..	1	..	..	2
Grewia tiliaefolia	8	9	9	7	6	4	3	2	48
Lagertroemia lanceolata	6	4	6	4	3	2	3	2	30
Cordia dichotoma	2	1	1	1	1	..	..	..	6
Albizzia odoratissima	1	1	1	1	2	1	..	..	7
Radermachera xylocarpa	1	..	..	..	..	..	..	..	1
Vitex altissima	1	..	..	..	..	..	..	..	1
Stereospermum personatum	..	..	..	1	1	..	..	..	2
Gmelina arborea	1	1	1	..	..	..	..	..	3
Machilus macrantha	2	1	1	..	..	..	..	..	4

Compartment:—Mount Stuart 74

Area of compartment included in the working circle and proposed for conversion—28·50 hectares.

Species. (1)	91–120 (2)	121–150 (3)	151–180 (4)	181–210 (5)	211–240 (6)	241–270 (7)	271–300 (8)	*Above* 300 (9)	*Total.* (10)
Terminalia paniculata	..	1	1	1	1	..	..	1	6
Grewia tilieafolia	..	4	5	5	4	3	2	2	26
Lagerstroemia lanceolata	..	4	2	3	2	2	1	1	16
Cordia dichotoma	..	1	1	1	..	1	..	..	4
Albizzia odoratissima	..	..	..	1	..	1	..	..	2
Radermachera xylocarpa	..	1	..	..	..	..	..	..	1
Machilus macrantha	..	1	..	..	..	..	..	..	1

Compartment :—Mount Stuart 75

Area of compartment included in the working circle and proposed for conversion—28·18 hectares.

Species. (1)	91–120 (2)	121–150 (3)	151–180 (4)	181–210 (5)	211–240 (6)	241–270 (7)	271–300 (8)	*Above* 300 (9)	*Total.* (10)
Terminalia paniculata	..	1	1	1	1	1	1	1	8
Terminalia tomentosa	..	..	1	..	..	..	..	..	1
Grewia tiliaefolia	..	4	5	5	4	3	3	2	28
Lagerstroemia lanceolata	..	4	2	3	2	2	1	2	18
Cordia dichotoma	..	2	1	1	..	1	..	..	5
Albizzia odoratissima	..	1	1	1	1	1	..	..	5
Radermachera xylocarpa	..	1	..	..	..	..	..	..	1
Vitex altissima	..	1	..	..	..	..	..	..	1
Gmelina arborea	..	1	..	..	..	..	..	..	1
Machilus macrantha	..	1	..	..	..	..	..	..	1

Species. (1)	*Girth classes in centimetres.* 91–120 (2)	121–150 (3)	151–180 (4)	181–210 (5)	211–240 (6)	241–270 (7)	271–300 (8)	*Above* 300 (9)	*Total.* (10)
Compartment :—Mount Stuart 76	**Area of compartment included in the working circle and proposed for conversion — 34·44 hectares.**								
Tectona grandis	1	1	..	2	..	..	..	..	4
Dalbergia latifolia	2	1	..	..	..	..	..	..	3
Terminalia paniculata	1	1	1	1	1	..	1	..	6
Terminalia tomentosa	..	1	..	..	..	..	..	..	1
Grewia tiliaefolia	5	6	6	5	4	3	2	2	33
Lagerstroemia lanceolata	4	3	4	3	2	1	2	1	20
Cordia dichotoma	2	1	1	1	1	..	..	..	6
Albizzia odoratissima		1	1	1	1	1	..	..	6
Radermachera xylocarpa	1	..	..	..	..	..	..	..	1
Vitex altissima	1	..	..	..	..	..	..	..	1
Gmelina arborea	1	..	..	..	..	..	..	..	1
Machilus macrantha	1	1	..	..	..	..	..	..	2
Compartment :—Mount Stuart 77	**Area of compartment included in the working circle and proposed for conversion — 35·60 hectares.**								
Tectona grandis	..	..	1	..	..	..	..	..	1
Dalbergia latifolia	1	1	..	..	..	..	..	..	2
Terminalia paniculata	1	1	1	1	1	1	..	1	7
Terminalia tomentosa	..	1	..	..	..	1	1	..	3
Grewia tiliaefolia	5	6	7	5	4	3	2	1	33
Lagerstroemia lanceolata	..	3	4	3	3	1	2	1	17
Cordia dichotoma	1	1	1	1	1	..	..	..	5
Albizzia odoratissima	1	1	..	1	..	1	..	..	4
Radermachera xylocarpa	1	1	1	1	..	..	..	..	4
Mitragyna parvifolia	1	..	..	..	..	..	..	..	1
Vitex altissima	1	..	..	..	..	..	..	..	1
Gmelina arborea	1	..	..	..	..	..	..	..	1
Machilus macrantha	..	1	..	..	..	..	..	..	1
Compartment :—Mount Stuart 78	**Area of compartment included in the working circle and proposed for conversion — 16·65 hectares.**								
Terminalia paniculata	..	1	..	1	..	—	..	1	3
Grewia tiliaefolia	3	3	3	2	2	2	1	1	17
Lagerstroemia lanceolata	2	1	2	1	1	1	1	..	9
Cordia dichotoma	1	1	..	..	..	..	..	..	2

Note : *Vitex altissima* and *Machilus macrantha* although decidedly evergreen, are found to occur sporadically in deciduous forests.

Section 2—STATISTICS RELATING TO EVERGREEN SPECIES.

498. *Local out-turn tables.*—The sub-joined volume and sleeper out-turn statements for evergreen species in the Punachi Range have been prepared from trees felled during the past 8 years in the selection coupes of Sheikalmudi and Italiar Valleys. All the species noted therein are presently accepted by the Railways as sleepers. The graphs have been based on data collected from 100 trees belonging to each girth class in each of the species. Although the exploitable girth for the Evergreen Selection Working Circle was fixed at 2.13 metres in the past working plan, the required number of trees in the lower girth classes for compiling this data has been obtained from wind-falls and smaller trees felled during road making.

Girth class in centimetres. (1)	*Volume of timber in cubic metres.* (2)	*Out-turn in Broad-guage units.* (3)
(a) MESUA FERREA.		
120·1 to 150·0	0.98	6·0
150·1 to 180·0	1·37	8·2
180·1 to 210·0	1·85	11·0
210·1 to 240·0	2·38	14·5
240·1 to 270·0	3·02	19·3
270·1 to 300·0	3·65	24·9
300·1 to 330·0	4·40	31·0
330·1 to 360 0	5·40	37·5
360·1 to 390·0	6·42	44·5
390·1 to 420·0	7·55	52·6
420·1 to 450·0	8·75	60·0

Girth class in centimeters. (1)	*Volume of timber in cubic metres.* (2)	*Out-turn in Broad guage units.* (3)
(b) CALOPHYLLUM ELATUM.		
120·1 to 150·0	1·05	10·0
150·1 to 180·0	1·45	13·0
180·1 to 210·0	2·00	16·0
210·1 to 240·0	2·55	19·8
240·1 to 270·0	3·30	23·7
270·1 to 300·0	4·30	28·1
300·1 to 330·0	5·45	33·1
330·1 to 360·0	6·65	39·1
360·1 to 390·0	7·85	45·9
390·1 to 420·0	9·00	53·1
420·1 to 450·0	10·25	61·0
(c) POECILONEURON INDICUM.		
120·1 to 150·0	1·60	7·0
150·1 to 180·0	2·05	9·2
180·1 to 210·0	2·47	11·5
210·1 to 240·0	2·95	14·0
240·1 to 270·0	3·45	16·9
270·1 to 300·0	4·00	19·9
300·1 to 330·0	4·55	23·5
330·1 to 360·0	5·25	27·7
360·1 to 390·0	5·95	32·2
390·1 to 420·0	6·70	37·9
420·1 to 450·0	7·40	44·0
(d) CULLENIA ROSAYROANA.		
120·1 to 150·0	1·15	7·9
150·1 to 180·0	1·55	10·6
180·1 to 210·0	2·05	14·0
210·1 to 240·0	2·45	17·5
240·1 to 270·0	3·15	21·8
270·1 to 300·0	3·80	27·0
300·1 to 330·0	4·65	32·5
330·1 to 360·0	5·70	38·7
360·1 to 390·0	6·80	45·6
390·1 to 420·0	7·93	52·5
420·1 to 450·0	9·00	60·9
(e) PALAQUIUM ELLIPTICUM		
120·1 to 150·0	0·72	6·1
150·1 to 180·0	1·15	8·6
180·1 to 210·0	1·62	11·8
210·1 to 240·0	2·20	15·2
240·1 to 270·0	2·77	19·0
270·1 to 300·0	3·38	23·1
300·1 to 330·0	4·00	27·9
330·1 to 360·0	4·72	33·3
360·1 to 390·0	5·40	39·1
390·1 to 420·0	6·15	46·0
420·1 to 450·0	6·90	53·7
(f) CANARIUM STRICTUM.		
120·1 to 150·0	1·26	8·3
150·1 to 180·0	1·72	11·7
180·1 to 210·0	2·25	15·5
210·1 to 240·0	2·85	20·2
240·1 to 270·0	3·60	25·3
270·1 to 300·0	4·50	31·0
300·1 to 330·0	6·55	37·9
330·1 to 360·0	6·55	46·0
360·1 to 390·0	7·60	54·6
390·1 to 420·0	8·65	63·9
420·1 to 450·0	9·65	73·5

499. *Partial enumeration of areas included in the Evergreen Selection Working Circle.*—A ten per cent sampling of the areas proposed for inclusion in the Evergreen Selection Working Circle was made in order to determine the number of trees above the exploitable girth fixed for the working circle and also study the distribution of the various age classes in the growing stock. The enumerations were carried out by the method of 'stratified random sampling'. Apart from the areas already divided into compartments

in the Palakadavu Block, other areas proposed for inclusion in the Evergreen Selection Working Circle were also divided into compartments or strata based on drainage and species composition along with the rest of the division (*vide* paragraph 514 of Chapter I of Part II). Within each compartment or stratum, a representative sample area approximating to about 10 per cent of the area included within the Evergreen Selection Working Circle was laid out along the fertility gradient and all trees belonging to certain species above a breast height girth of 30 centimetres occurring within the plot were enumerated. The enumeration was conducted in 30 centimetres girth classes.

500. The species anumerated were.—*Mesua ferrea*, *Calophyllum elatum*, *Palaquium ellipticum*, *Poeciloneuron indicum*, *Cullenia rosayroana*, *Canarium strictum*, *Vateria indica*, *Dysoxylum malabaricum*, *Artocarpus heterophyllus*, *Ailanthus triphysa*, *Salmalia malabarica*, *Cedrela toona*, *Vitex altissima*, *Bischofia javanica*, *Diospyros ebenum*, *Tetrameles nudiflora*, *Croton oblongifolius* and *Vatica chinenss*.

501. The evergreens are at present solely exploited for sleepers. Not all the species enumerated are being utilised for sleeper supply. However it was considered desirable to enumerate other important species also at the same time without incurring any extra expenditure, as the data thus collected will be useful when markets are found for these additional species (N. V. Brasnett, 1953).

Species.	Girth classes in centimetres.												Total.
	31–60	61–90	91–120	121–150	151–180	181–210	211–240	241–270	271–300	301–330	331–360	above 360	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Compartment :—Italiar 4—							*Area of compartment included in the working circle—201·50 hectares.*						
Mesua ferrea	219	180	228	142	109	97	109	68	72	46	45	35	1,350
Palaquium ellipticum ..	220	180	120	140	90	102	93	49	42	24	22	31	1,113
Cullenia rosayroana ..	350	210	160	93	68	59	36	41	44	22	28	63	1,174
Canarium strictum ..	1	3	2	2	..	..	..	..	..	..	..		8
Vateria indica	..	2	..	1	2	1	1	2	..	1	..	1	11
Dysoxylum malabaricum.	31	19	9	5	1	2	3	2	..	..	..	2	74
Artocarpus heterophyllus.	14	7	11	13	11	10	5	8	5	3	3	5	95
Ailanthus triphysa ..	7	2	1	3	..	..	1	..	..	..	..	..	14
Bischofia javanica ..	127	53	17	5	4	2	2	1	..	1	1	1	214
Diospyros ebenum ..	3	..	2	..	..	..	..	..	..	..	..	..	5
Croton oblongifolius ..	164	48	25	6	2	2	5	..	2	1	..	1	256
Vatica chinensis ..	35	27	32	11	6	7	2	3	1	1	1	..	126
Compartment :—Italiar 5—							*Area of compartment included in the working circle—174·00 hectares.*						
Mesua ferrea	140	125	116	103	87	71	55	43	33	25	18	13	829
Palaquium ellipticum ..	70	55	37	26	19	15	11	8	6	6	4	5	262
Poeciloneuron indicum..	814	620	437	321	277	156	92	72	57	42	28	19	2,935
Cullenia rosayroana ..	135	127	121	115	102	91	61	52	38	27	18	13	900
Canarium strictum ..	..	2	1	1	1	..	..	..	..	..	..	..	5
Vateria indica	..	1	..	1	1	..	..	1	..	1	..	1	6
Dysoxylum malabaricum.	70	65	58	49	30	23	19	15	9	6	3	2	349
Artocarpus heterophyllus.	55	47	33	27	19	12	11	7	5	3	2	1	222
Ailanthus triphysa ..	20	15	12	9	8	5	3	2	..	..	..	..	74
Bischofia javanica ..	16	13	11	9	6	3	2	1	1	..	..	..	62
Diospyros ebenum ..	6	5	3	1	..	..	..	..	..	..	..	..	15
Croton oblongifolius ..	3	2	..	..	1	2	1	..	..	..	..	1	10
Vatica chinensis ..	2	1	2	1	..	..	1	2	1	1	..	..	11
Compartment :—Italiar 6—							*Area of compartment included in the working circle—129·00 hectares.*						
Mesua ferrea	130	118	108	92	75	64	35	23	15	12	11	8	691
Palaquium ellipticum ..	53	32	25	19	18	13	10	12	9	6	3	2	202
Poeciloneuron indicum ..	549	450	325	277	230	180	147	120	90	75	52	37	2,532
Cullenia rosayroana ..	138	137	104	61	45	39	24	19	17	12	9	3	608
Canarium strictum ..	..	2	1	..	2	..	..	..	..	..	..	..	5
Vateria indica ..	..	..	1	..	1	..	..	2	1	..	..	..	5
Dysoxylum malabaricum.	10	9	6	3	..	2	2	1	..	3	3	3	42
Artocarpus heterophyllus.	9	7	5	3	2	6	3	5	3	2	2	3	50
Ailanthus triphysa ..	5	1	..	2	..	..	1	..	..	..	..	..	9
Bischofia javanica ..	10	9	6	4	2	1	1	..	..	..	2	..	35
Croton oblongifolius ..	7	5	4	3	1	1	3	..	1	..	..	1	26
Vatica chinensis ..	5	4	3	2	2	3	1	1	..	..	..	1	22

Species.	*Girth classes in centimetres.*												Total
	31–60	61–90	91–120	121–150	151–180	181–210	211–240	241–270	271–300	301–330	331–360	*Above* 360	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Compartment :—*Italiar* 7—							*Area of compartment included in the working circle*—156·00 *hectares.*						
Mesua ferrea	130	98	87	79	64	56	37	30	31	27	..	11	650
Calophyllum elatum ..	6	..	5	5	..	4	4	..	..	..	..	..	24
Palaquium ellipticum ..	48	32	22	23	7	4	4	1	1	..	..	..	142
Poeciloneuron indicum ..	158	140	100	96	86	75	61	53	37	37	38	172	1,053
Cullenia rosayroana ..	162	97	77	49	46	27	22	26	25	11	10	33	585
Canarium strictum ..	12	6	3	2	2	1	2	1	..	1	..	..	30
Artocarpus heterophyllus.	16	16	12	9	5	7	3	3	1	1	1	..	74
Ailanthus triphysa ..	29	26	17	12	4	3	2	1	..	..	..	..	92
Cedrela toona	23	19	17	12	4	3	2	1	..	..	..	..	81
Bischofia javanica ..	50	42	20	6	3	4	3	1	1	1	1	..	132
Diospyros ebenum ..	53	27	17	9	3	4	..	3	1	..	..	..	117
Vatica chinensis ..	120	104	63	32	21	11	1	2	1	..	..	..	355
Compartment :—*Kallar* 22 —							*Area of compartment included in the working circle*—44 *hectares.*						
Mesua ferrea	124	114	90	79	63	54	41	30	29	27	11	..	595
Calophyllum elatum ..	14	13	12	10	6	5	4	..	..	..	..	..	64
Palaquium ellipticum ..	40	25	18	16	6	4	4	1	1	..	..	..	790
Poeciloneuron indicum ..	150	132	120	87	53	49	35	29	19	11	9	96	28
Cullenia rosayroana ..	152	91	69	35	32	25	20	19	19	8	7	29	506
Canarium strictum ..	11	6	3	2	1	1	2	1	1	..	..	..	662
Artocarpus heterophyllus.	41	25	16	7	3	3	2	1	1	..	1	..	100
Ailanthus triphysa ..	22	14	14	10	9	4	6	2	3	1	1	..	86
Cedrela toona	2	1	2	1	..	1	1	..	..	..	..	..	8
Bischofia javanica ..	81	39	18	6	3	4	4	1	1	2	1	..	159
Diosypros ebenum ..	42	21	15	8	2	3	..	3	1	..	..	..	95
Vatica chinensis	91	63	29	10	9	2	2	1	..	..	..	..	207
Compartment :—*Kallar* 25—							*Area of compartment included in the working circle*—135·00 *hectares.*						
Mesua ferrea	124	114	90	79	64	56	42	33	31	27	11	..	671
Calophyllum elatum ..	10	..	13	13	..	10	10	..	..	..	..	..	56
Palaquium ellipticum ..	48	31	22	23	7	4	4	1	1	..	..	..	141
Poeciloneuron indicum ..	146	132	120	87	53	46	32	32	33	19	18	130	848
Culleniarosayroana ..	162	98	78	49	47	27	23	25	24	11	10	33	587
Canariumstrictum ..	11	6	3	2	1	1	2	1	1	..	..	..	28
Artocarpus heterophyllus.	49	25	16	7	3	3	2	1	1	..	1	..	108
Ailanthus triphysa ..	22	14	14	10	9	4	6	2	3	1	1	..	86
Cedrela toona	2	1	2	1	..	1	1	..	..	..	..	..	8
Bischofia javanica ..	82	37	18	6	3	4	4	1	1	1	1	..	158
Diospyros ebenum ..	46	24	15	8	2	3	..	3	1	..	..	..	102
Vatica chinensis ..	97	55	29	10	9	2	2	1	..	..	..	..	205

Compartment— Palakadavu 102— *Area of compartment included in the working circle*—34·50 *hectares.*

Mesua ferrea	8	7	3	4	4	2	3	2	1	..	..	8	**42**
Calophyllum elatum ..	275	127	27	..	11	..	..	11	11	11	12	10	**495**
Palaquium ellipticum ..	155	59	55	46	31	29	18	9	3	5	2	4	**416**
Cullenia rosayroana ..	125	15	17	11	4	4	7	3	3	3	4	8	204
Canarium strictum ..	1	2	1	1	..	..	..	..	..	..	..	..	5
Vateria indica	395	124	192	61	41	32	16	21	..	..	..	1	905
Dysoxlyum malabaricum..	172	69	17	6	4	3	..	..	1	3	2	..	**277**
Artocarpus heterophyllus	1	1	..	..	..	..	..	..	..	..	..	..	**2**
Ailanthus triphysa ..	11	43	11	5	2	..	..	..	..	..	..	..	**72**
Salmalia malabarica ..	..	..	..	..	..	..	..	..	..	..	..	1	1
Cedrela toona	2	2	..	..	2	..	2	..	..	..	..	..	8
Vitex altissima	2	1	..	2	1	..	..	..	..	1	1	1	9
Bischofia javanica ..	6	6	4	3	2	2	2	..	2	..	..	..	**27**
Diospyros ebenum ..	10	5	3	2	1	2	..	..	..	..	..	..	**23**
Croton oblongifolius ..	11	4	3	2	1	..	..	1	..	..	..	..	**22**
Vatica chinensis ..	8	4	4	2	2	..	..	..	..	..	..	..	20

Compartment—Palakadavu 103— *Area of compartment included in the working circle*—151·00 *hectares.*

Mesua ferrea	33	27	17	16	11	9	6	4	2	..	1	1	127
Calophyllum elatum ..	320	280	210	165	90	45	29	18	11	9	6	4	1,187
Palaquium ellipticum ..	259	236	218	185	124	116	73	37	18	13	8	6	1,293
Cullenia rosayroana ..	101	69	61	46	32	29	24	16	13	12	9	8	420
Canarium strictum ..	8	5	4	4	..	..	..	..	..	..	..	..	21
Vateria indica	689	415	325	220	175	107	92	78	58	35	22	13	2,229
Dysoxylum malabaricum..	219	192	180	151	122	93	65	48	36	20	11	9	1,146
Artocarpus heterophyllus	5	..	3	2	..	2	..	2	..	1	..	..	15
Ailanthus triphysa ..	45	30	23	16	7	2	..	..	..	..	..	..	123
Salmalia malabarica ..	..	..	..	..	..	..	..	..	..	..	2	3	5
Cedrela toona	8	7	5	3	..	2	..	2	..	..	..	..	27
Vitex altissima	7	5	..	4	2	2	2	1	1	..	..	1	25
Bischofia javanica ..	23	18	14	11	9	7	4	4	2	2	..	..	94
Diospyros ebenum ..	40	25	19	11	9	5	3	..	1	..	..	..	113
Tetrameles nudiflora ..	2	2	2	..	..	..	1	..	2	..	..	..	7
Croton oblongifolius ..	42	38	16	12	7	4	2	..	..	..	..	..	121
Vatica chinensis	31	18	16	9	5	2	1	..	..	..	..	..	82

Compartment—Palakadavu 104— *Area of compartment included in the working circle*—151·00 *hectares.*

Mesua ferrea	27	18	17	15	13	10	8	7	4	..	2	2	123
Calophyllum elatum ..	534	490	337	351	280	245	228	210	170	120	90	50	3,145
Palaquium ellipticum ..	440	380	295	220	192	155	136	101	80	70	55	30	2,154
Cullenia rosayroana ..	102	88	70	55	42	35	27	18	12	9	7	5	368
Canarium strictum ..	8	5	4	2	1	1	..	..	..	..	..	..	21
Vateria indica	690	585	510	475	410	350	297	..	11	3	3	6	3,340
Dysoxylum malabaricum..	390	315	275	248	225	187	158	131	90	71	50	20	2,160
Artocarpus heterophyllus	6	..	4	3	..	2	..	1	..	1	..	..	17
Ailanthus triphysa ..	171	122	97	85	71	62	..	..	..	..	..	..	608
Salmalia malabarica ..	8	7	5	3	..	2	..	2	..	..	..	..	27
Cedrela toona	7	6	..	4	4	3	2	2	..	1	1	1	31

Species.	Girth classes in centimetres.												Total.
	31-60	61-90	91-120	121-150	151-180	184-210	211-240	241-270	271-300	301-330	331-360	Above 300	
(1)	(2)	(4)	(5)	(6)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Vitex altissima	25	21	17	13	11	9	5	4	3	2	1	..	111
Bischofia javanica.. ..	41	30	23	17	13	8	5	..	3	..	..	..	140
Diospyros ebenum ..	3	2	1	..	..	..	1	1	1	..	..	..	9
Tetrameles nudiflora ..	42	25	18	9	5	1	..	..	1	..	..	..	101
Croton oblongifolius ..	31	19	14	9	6	2	..	..	..	1	..	..	82
Vatica chinensis	21	17	16	8	5	3	..	..	..	3	..	..	73
Compartment ;—Parayankadavu 1—							*Area of compartment included in the working circle*—30.00 *hectares.*						
Mesua ferrea	130	56	14	6	13	10	2	..	1	..	15	..	247
Calophyllum elatum ..	128	59	61	47	29	121	41	2	45	..	..	..	533
Palaquium ellipticum ..	270	47	44	37	25	23	15	17	12	20	8	30	548
Cullenia rosayroana ..	20	15	18	12	2	4	8	3	2	3	1	7	95
Canarium strictum ..	11	16	12	11	..	..	..	..	..	..	..	..	50
Vateria indica	5	3	2	4	..	..	3	2	2	..	..	2	23
Dysoxylum malabaricum	69	54	22	4	3	2	26	8	14	..	25	..	227
Artocarpus heterophyllus	11	..	..	..	2	..	..	..	..	10	..	..	23
Ailanthus triphysa ..	10	34	4	2	..	..	..	..	..	..	..	..	50
Cedrela toona	2	2	..	4	..	..	2	..	..	..	..	..	10
Vitex altissima	14	6	..	12	..	..	..	..	4	6	6	3	51
Bischofia javanica ..	5	5	3	3	2	8	2	2	..	..	..	..	30
Diospyros ebenum ..	8	4	2	2	..	1	1	..	..	..	..	..	18
Croton oblongifolius ..	8	3	3	2	..	..	2	..	..	..	..	..	18
Vatica chinensis	6	3	3	1	1	1	..	1	..	..	..	..	15
Compartment :—Parayankadavu 2.—							*Area of compartment included in the working circle*—102·5 *hectares.*						
Mesua ferrea ..	130	56	14	6	13	10	2	..	1	..	15	..	247
Calophyllum elatum ..	123	47	44	37	25	23	15	17	12	20	8	30	401
Palaquium ellipticum ..	220	59	61	29	121	41	12	45	47	..	..	..	635
Cullenia rosayroana ..	20	15	18	12	2	4	8	3	2	3	1	7	95
Canarium strictum ..	11	16	12	11	..	..	..	..	..	..	..	..	50
Vateria indica ..	5	3	2	4	..	..	3	2	2	..	..	2	23
Dysoxylum malabaricum ..	69	54	22	4	3	2	26	8	14	..	..	25	227
Artocarpus heterophyllus ..	11	..	..	..	2	..	..	..	..	10	..	..	23
Ailanthus triphysa ..	10	32	4	2	..	..	..	..	..	..	..	..	48
Salmalia malabarica ..	..	..	..	..	..	..	..	..	..	..	1	2	3
Cedrela toona ..	6	5	3	2	..	3	..	1	..	..	..	..	20
Vitex altissima ..	5	2	..	5	3	1	1	2	..	5	4	..	28
Bischofia javanica ..	17	18	12	8	7	2	3	1		..	..	..	69
Diospyros ebenum ..	30	14	8	7	3	3	1	..	1	..	..	..	67
Tetrameles nudiflora ..	..	2	..	1	..	..	..	..	..	..	..	..	3
Croton oblongifolius ..	32	11	9	5	3	2	..	..	..	1	..	..	63
Vatica chinensis ..	23	12	12	6	2	1	..	2	..	..	..	..	58

Compartment:—Perumkundru 9.

Area of compartment included in the working circle—23·5 hectare.

Calophyllum elatum	..	23	9	11	2	2	2	1	..	1	..	..	..	51
Palaquium ellipticum	..	37	20	9	5	10	20	2	..	2	3	2	..	110
Poeciloneuron indicum	..	3	5	4	2	1	..	..	..	..	3	..	1	19
Canarium strictum	..	2	4	3	3	..	..	..	..	..	..	..	..	12
Vateria indica	..	..	3	..	2	3	3	3	2	..	3	..	3	22
Dysoxylum malabaricum	..	75	16	3	3	2	4	..	..	..	3	..	1	107
Artocarpus heterophyllus	..	..	..	..	..	..	..	2	..	..	1	..	..	3
Ailanthus triphysa	..	11	4	1	4	1	1	..	..	..	..	..	..	22
Salmalia malabarica	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Vitex altissima	..	3	2	..	3	2	..	..	..	3	3	..	2	18
Bischofia javanica	..	4	3	4	4	..	4	1	2	..	1	2	..	25
Diospyros ebenum	..	6	1	1	..	..	..	..	..	1	..	..	..	9
Croton oblongifolius	..	49	16	8	7	5	1	2	1	..	..	..	..	89
Vatica chinensis	..	40	19	15	4	7	2	..	1	..	..	..	..	88

***Note.**—Salmalia malabarica* although a deciduous species, occurs sporadically in some of the evergreen compartments.

Section 3—STATISTICS RELATING TO FUEL WOOD.

503. The calorific values of wood specimens of the newly introduced exotics in the Anamalais such as *Eucalyptus grandis, Eucalyptus robusta* and the Mysore *Eucalyptus* hybrid were analysed at the Fuel Research Institute, Dhanbad in order to compare the usefulness of these species as fuel-wood with some of the other important fuel species in the State. Wood specimens of *Eucalyptus grandis* (9 year old) and *Eucalyptus robusta* (12 years old) were obtained from the Nullacathu Estate. Of these two species, *Eucalyptus robusta* does not occur in the Government forests, and as it freely hybridises with the closely allied *Eucalyptus grandis* (proposed for large scale introduction), it was decided to determine its calorific value in comparison with that for *Eucalyptus grandis* in order to see whether hybridisation may have any deleterious effects in the quality of the progeny as fuel-wood. The results of the analysis show that *Eucalyptus robuslo* is a slightly better fuel-wood than *Eucalyptus grandis* as it has a higher calorific value.

504. In the case of the *Eucalyptus* hybrid, the existing plantations predominantly consist of various stages of hybridisation of the following three Eucalyptus species namely *Eucalyptus tereticornis, Eucalyptus camaldulensis* and *Eucalyptus robusta.* Tree specimens with features predominantly resembling each of these tree species (as could be judged by a study of their bark, flower buds, capsules and juvenile leaves with reference to Blakely's Key and Maiden's illustrations) were selected from the oldest plantation in the Gudaravalli Series and sent to Dhanbad for calorific analyses. The results of the analyses show that there is no appreciable variation in the different varieties of the Mysore hybrid as regards their suitability as fuel-wood.

505. The results of the analysis conduct on wood specimens of the species referred to above and other recognised fuel species are quoted below :—

Serial number.	*Species.*	*Sampls analysed (Sap or heartwood or average).*	*Moisture in the air-dried wood.*	*Ash in the completely dried sample.*	*Calorific value of completely dried and ash free material.*		*Remarks.*
			Percent.	*Percent.*	*Calories.*	*British Thermat Units per lb.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Eucalyptus grandis	Average	—	—	4,310 (air-dried)	7,760 (air-dried)	Moisture in the air dried wood and ash in the completely dried sample have not been worked out for this species.
2.	Eucalyptus robusta ..	Average	7·90	1·30	4,890	8,800	
3.	Eucalyptus hybrid wlth features predominantly resembling Eucalyptus tereticornis.	Average	8·5	1·20	4,880	8,780	
4.	Eucalyptus hybrid with features predominantly resembling Eucalyptus camaldulensis.	Average	6·8	1·30	4,880	8,780	
5.	Eucalyptus hybrid with features predominantly resembling Eucalyptus robusta.	Average	8·0	1·25	4,885	8,790	
6.	Eucalyptus globulus ..	Sapwood	12·34	0·25	4,962	8,932	
7.	Tamarindus indica ..	Sapwood	7·10	2·73	4,909	8,837	
	Tamarindus indica ..	Heartwood	8·13	3·42	4,969	8,945	
8.	Anogeissus latifolia ..	Sapwood	5·40	4-52	4,980	8,976	
	Anogeissus latifolia ..	Heartwood	15·52	11·00	4,909	8,837	
9.	Acacia arabica	Sapwood	10·47	0·86	4.793	8,627	
	Acacia arabica	Heartwood	9·26	0·03	4,946	8.903	
10.	Albizzia amara	Sapwood	8·45	3·78	5,049	9.088	
	Albizzia amara	Heartwood	8·40	2·36	53.06	9,550	
11.	Albizzia lebbek	Sapwood	4·98	1·29	5,163	9.294	
	Albizzia lebbek	Heartwood	5·74	0·68	5.160	9,301	
12.	Holoptelea integrifolia	Sapwood	8·65	0·59	5,131	9,236	
	Holoptelea intagrifolia ..	Heartwood	17·85	1·49	5,266	9,480	

NOTE.—Data for items 6 to 12 were obtained from Indian Forest Bulletin No. 79—Chemistry Series—1932).

SECTION 4.—MISCELLANEOUS STATISTICS.

506. *Chemical analysis of Eucalyptus grandis wood.*—" High alpha-cellulose pulp has been prepared from *Eucalyptus grandis* wood by the water pre-hydrolysis sulphate process followed by multi-stage bleaching. These pulps can be considered for preparing various cellulose products like viscose rayon, tire cord, nitro-cellulose, etc., provided these pulps pass further tests required. " The results of the chemical analysis are furnished below :—

Alpha cellulose per cent	94.5
Beta cellulose per cent	4.3
Gamma cellulose per cent	3.7
Pentosans per cent	1.5
Ash per cent	0.1

(Extract from Indian pulp and paper, Volume XVIII, No. 3, September, 1963).

507. The wood specimens for the above analysis were obtained from the Peermedu plantations in Kerala where the locality factors are similar to that of the Anamalais. These results indicate that *Eucalyptus grandis* if grown on a large scale in the Anamalais is a potential source of raw material for the establishment of cellulose based industries.

508. *Yield of camphor and camphor oil content in Ocimum kilimandscharicum.*—*Ocimum kilimandscharicum* leaves collected from plants raised as a cover crop in the Ulandi teak plantations were sent to the Manufacturing Chemist, Government Cinchona Factory, Anamalais for distillation. The results of distillation are furnished below :—

	Yield of Camphor and Camphor oil.					
Weight of air dried leaves distilled.	*Camphor crystals congealed in the condensor.*	*Oil laden with some camphor.*	*Total distillate (Camphor and oil).*	*Percentage of total distillate on air dry basis.*	*Percentage of total distillate on zero moisture basis.*	***Remarks.***
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Kgs.	Kgs.	Kgs.	Kgs.			
42·25	0·420	0·478	0·898	2,12	2·45	

PART II.

FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED.

CHAPTER I—BASIS OF PROPOSALS.

SECTION 1—OBJECTS OF MANAGEMENT.

509. The objects of management may be summarised as follows :—

(i) To conserve the forests of the division in the interests of soil conservation, water-supply and agriculture with particular reference to the catchment areas of the Amaravathi and the artificial reservoirs formed under the Parambikulam-Aliyar Project;

(ii) to exploit with due regard to silvicultural principles, the resources of these forests in timber, fuel, bamboos and minor forest produce with a view to meet the requirements of the local population to the extent possible;

(iii) to increase the productivity of the forest by enforcing rigid protection and by artificially regenerating suitable areas with more valuable species such as teak, *Eucalyptus* hybrid and other indigenous fuel and timber species;

(iv) to rehabilitate the degraded ex-panchayat forests of Dharapuram Taluk by artificially regenerating suitable patches with indigenous Acacias and other useful species, so that these areas may serve as wind breaks as also useful sources of fuel to the local populace;

(v) to rehabilitate the areas recovered from the Cinchona Department in the Anamalais by artificially regenerating them with fast growing species like *Eucalyptus grandis* for production of industrial raw material like wood pulp for the paper and rayon industries;

(vi) to increase the production of minor forest produce and their proper utilisation;

(vii) to provide grazing facilities to the villagers adjoining the forests consistent with the principles of forest conservancy;

(viii) to ameliorate the conditions of the hill tribes resident in the forests;

(xi) generally to take all steps to attain the maximum financial return per acre of forest in perpetuity.

SECTION 2—METHODS OF TREATMENT TO BE ADOPTED.

510. The methods of treatment to be adopted varies with each of the working circles and are described in detail in the following chapters. Prescriptions and suggestions on matters not covered by the different working circles are indicated in the chapter on 'Miscellaneous Regulations'.

SECTION 3—WORKING CIRCLES, THEIR AREA AND DISTRIBUTION.

511. To realise the objects of management in view, the following circles have been constituted.

Serial number.	*Name of the Working Circle.*	*Area in hectares.*
1.	The Teak Plantation Working Circle	2,822·89
2.	The Evergreen Selection Working Circle	1,330·00
3.	The Fuel Working Circle	6,282·00
4.	The Eucalyptus Hybrid Working Circle	834·00
5.	The Irrigated Teak Plantation Working Circle	115·00
6.	The Rehabilitation Working Circle	320.50
7.	The Bamboo Working Circle	11,789·61
8.	The Minor Forest Produce Working Circle	All the reserves excepting areas allotted to hill tribes or leased to other departments.

512. The Deciduous Selection Working Circle constituted in the previous plan has been omitted for the following reasons :—

(i) All the areas which constituted the Tunacadavu Selection Felling Series of the previous plan have been transferred to the Kerala State following ' States ' Reorganisation

(ii) Bulk of the areas which constituted the old Ulandi Selection Felling Series has been included in the Teak Plantation Working Circle with prescriptions for clear felling and planting with teak. The little area that has been left over does not have any trees of exploitable girth and therefore cannot be considered for inclusion in a Deciduous Selection Working Circle.

(iii) The areas which constituted the Villoni Selection Felling Series of the previous plans were worked during 1941–42 and 1942–43 for the whole period of the felling cycle, the total area of this series being only 271.14 hectares. As the felling cycle adopted is 40 years, this series is to be worked only after 1980. The exploitation of this areas will have to be therefore considered only at the time of revision of this plan.

SECTION 4—BLOCKS AND COMPARTMENTS.

513. The blocks and compartments formed under previous plans are retained as such as they are of a permanent nature, although in several cases they have not been laid out with any reference to the drainage. This is particularly true of the Punachi Block where mostly imaginary boundaries have been adopted to delimit compartments; the compartments formed also are too small, the average area of a compartment in this block being 53 hectares.

514. In the preparation of this working plan, the rest of the division has also been divided into permanent blocks and compartments for purposes of management, description, location and record of works, and in order to study the improvement of the forest. Each range has been divided into blocks consisting of conveniently sized tracts of country preferably bounded by natural features and given a local name. Each block has been divided into one or more compartments with reference to natural features mostly, except in a few unavoidable instances where due to imaginary boundaries having been adopted in the past in delimiting range and division boundaries, the same had to be followed. The average size of a compartment has been kept at 250 hectares, but where the management is intensive, smaller compartments have been formed. The compartments in each block have been numbered serially. The division into blocks and compartments has been shown on the managements maps. A detailed statement showing the division into blocks and compartments in each range with particulars of areas allotted to the different working circles is given in Appendix I.

515. *Sub-compartments.*—No sub-compartments have been formed in this plan. Sub-compartment 20 (a) of the Punachi block formed by Venkateswara Ayyar has been merged with compartment 20 of the same block.

SECTION 5—PERIOD OF THE WORKING PLAN.

516. The working plan will be in force for a period of ten years from 1st April, 1965 to 31st March, 1975. However, prescriptions and table of fellings for the next five years are also made, in order to ensure the continuity of controlled working, in case the revision of this working plan is not taken up in time.

CHAPTER II—WORKING PLAN FOR THE TEAK PLANTATION WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

517. *Objects of management*.—The object of this working circle would be to manage the existing teak plantations in the Coimbatore South Division and to convert the mixed deciduous forests in suitable localities into the more valuable teak plantation.

518. *General constitution*.—The working circle will include all the existing plantations of teak in the Mount Stuart, Ulandi, Palakadavu, Punachi and Waterfall Blocks and areas considered suitable for conversion into teak plantatons in the Mount Stuart, Ulandi, Palakadari, Perumkundru and Parayanwadari Blocks. No planting is proposed in the Punachi and Waterfall Blocks, as past results do not encourage the belief that the continuation of teak planting in this series would be justified. In the Ulandi and Palakadavu Blocks, some areas which could be otherwise considered suitable for conversion into teak ,have to be however deleted, as they get submerged in the Parambikulam reservoir.

519. *Area*.—The area of the working circle will be 2,822.89 hectares. Of this an area of 1,293.89 hectares consists of areas planted already with teak. For convenience in management, the small patches of miscellaneous plantations raised along with the teak, blanks and falled patches occurring within the indivdual plantations are also included in this working circle. A detailed statement showing particulars of teak plantations raised in the division are given in Appendix IV.

520. *Character of the regetation*.—The natural forests proposed for conversion into teak plantations are either of the 'Southern tropical moist deciduous' type or the 'Southern tropical secondary moist deciduous type', according to the classification of Champion. The former type occurs only in the Mount Stuart Block where the average annual rainfall is about 170 centimetres, while the latter occurs in the Ulandi, Palakadavu, Perumkundru and Parayankadavu Blocks where the annual rainfall is above 250 centimetres. The chief tree species in both these types are generally the same—*Terminalia paniculata, Terminalia tomentosa, Lagerstroemia lanceolata, Grewia tiliaefolia, Tectona grandis, Cordia dichotoma, Radermachera xylocarpa, Stereospermum personatum, Dalbergia latifolia, Pterocarpus marsupium, Dillenia pentagyna, Salmalia malabarica, Adina cordifolia and Anogeissus latifolia.* The height growth is good—20 to 40 metres high. Large quantities of bamboos (*Bambusa arundinacea*) are scattered throughout. *Lantana* is profuse and comes up densely in any clearing. A detailed description of both the types is given in Chapter II of Part I.

521. As regards the teak plantations in the division, results of planting in the Tunacadavu Range have been mostly successful, but in the Punachi Range, due to unfavourable edaphic and climatic factors the results are not so fratifying.

SECTION 2—BLOCKS AND COMPARTMENTS.

522. The compartments in which this working circle is constituted are given in paragraph 523. Details regarding the areas included under this working circle in each of these compartments are given in Appendix I and shown on the concerned management maps.

SECTION 3—DIVISION OF THE AREA.

523. *Division into planting series.*—The working circle is divided into two series as follows:—

Serial number and name of series. (1)	*Area already planted in hectares.* (2)	*Area to be planted in hectares.* (3)	*Compartments in which the series occurs.* (4)
	(*a*) TUNACADAVU.		
1. Tunacadavu	988·21	1,529·00	Ulandi 85, 86, 88, 89 and 90. Palakadavu 91, 93 to 95, 98, 100 and 105. Perumkundru 9. Mount Stuart 52, 65, 66, 68 to 71, 74 to 78.
	(*b*) PUNACHI RANGE.		
2. Punachi	305·68	..	Punachi 1 to 14. Waterfall 6 and 7.

SECTION 4—ANALYSIS AND VALUATION OF THE CROP.

524. *Stockmapping.*—A detailed stockmapping of all areas suitable for clearfelling and planting with teak was done during the preparation of previous working plans. These areas were gone over again in addition to newer areas proposed for conversion. The presence of a mixed deciduous forest of good height growth with a fair admixture of bamboos was considered to indicate suitability for teak planting. Steep slopes, tops of hillocks, poorly drained areas, swamps, sites with a semi-evergreen type of growth and areas carrying a stand of stunted trees were excluded. Similarly areas with a heavy growth of bamboos also were excluded in many cases as teak invariably fails in such areas due to secondary regrowth of bamboos, not to speak of the necessity to conserve bamboos in such areas for the ever increasing demands of the pulp industry. Small patches of such unsuitable areas occurring within the selected areas will however have to be omitted by the District Forest Officer during the actual lay out of the plantations.

525. *Enumerations.*—In order to estimate the yield from each annual coupe, a 10 per cent enumeration of the areas proposed for conversion in the Mount Stuart Block was carried out by the method of 'systematic strip sampling'. The results of enumeration are tabulated in Chapter VI of Part I.

526. In the Ulandi, Palakadavu, Perumkundru and Parayankadavu Blocks which belong to a different ecological stratum, no enumeration as such was carried out, as an area of 506.27 hectares was clearfelled during the past few years for raising teak plantations; in addition an area of 278.83 hectares suitable for conversion into teak had to be clearfelled last year to accommodate the Parambikulam reservoir. Correct figures of the actual out-turn obtained from these areas are available, amounting in all to 51 per cent of the areas proposed for conversion into teak in these blocks. It was therefore proposed to use these figures despite statistical objections as they can be considered to be more reliable for the following reasons, not to speak of the saving in time and expenditure.

(i) The species composition and canopy density of the areas included is generally uniform with only small variations.

(ii) The data obtained is from a very much higher sample than what would have been normally obtained by a 10 per cent sampling of the area.

(iii) The data collected represents the actual out-turn by measurement of the felled produce in 51 per cent of the area, whereas in any sampling, errors are certainly bound to creep in due to factors, such as (*a*) errors of the method of enumeration, and (*b*) errors of the enumerating party.

SECTION 5—METHOD OF TREATMENT.

527. *Silvicultural system.*—The silvicultural system adopted will be the clearfelling system followed by concentrated artificial regeneration of teak by stumping.

528. *Subsidiary fellings.*—Areas suitable for planting are not very large, and since it is proposed to convert them as quickly as possible, no subsidiary fellings are prescribed.

529. *Choice of species for planting.*—Teak will be the primary species used in regenerating clearfelled areas. Since drainage appears to be the chief limiting factor for teak, areas which tend to develop swampy conditions as a result of the clearfelling and burning will be planted with *Terminalia tomentosa. Eucalyptus grandis* is another species which can be thought of for moister situations, but it does not prefer regular swamps as *Terminalia tomentosa.* Similarly out-crops of shallow soil which may exhibit themselves after clearfelling will be planted with *Dalbergia latifolia and Pterocarpus marsupium,* as teak is bound to fail in such areas. Rosewood will be also raised along the last three peripheral rous in all teak regeneration areas.

530. *Rotation—(a) Tunacadavu Series.* The rotation of 80 years tentatively adopted for teak in the Tunacadavu Range during the past two plans may be continued.

(*b*) *Punachi Series.*—Even the successful plantations of the Punachi Series correspond to site quality IV or below as per the 'Revised Yield and Stand Tables for plantation teak'. The stocking is also patchy in most of the plantations. A rotation of 40 years therefore considered quite adequate for this series.

531. *Regulation of the yield.*—For the clearfellings, no regulation of the yield is considered necessary as our object is to convert the existing natural stand into one of pure teak in as quick a time as possible, taking advantage of the funds provided in the successive 'Five-Year Plan Schemes' and the uncertainty of similar funds being made available in the future. The principles of sound forest management also require that a forest should be brought into a state of full production as soon as practicable, without prejudice to economic or other related factors. Most of the natural forests proposed for conversion have a canopy density of 0.5 or more often less than this, and bulk of the growing stock is composed of the less valuable deciduous species than teak. Moreover, in a teak plantation, a good part of the revenue is from thinnings alone which are performed well before half the rotation age is reached. All these reasons indicate the necessity for a quick conversion subject to administrative conveniences such as staff, availability of labour, funds, etc. It is therefore considered that an area of about 80 hectares in the Tunacadavu series be felled annually and planted with teak. The question of normalising the forests can be taken up when the plantations raised come for final fellings without any detriment to financial interests.

532. Excluding a few of the earliest plantations (Punachi 1922 and Tunacadavu 1872, 1890, 1900) which are very small in extent, none of the regular plantations come of rotation age during the period of this plan. Hence no felling of any of the existing teak plantations is contemplated during this plan period.

533. *Estimate of yield from clearfelling coupes.*—An estimate of the yield from each coupe in the Mount Stuart Block has been made on the basis of enumerations as referred to in paragraph 525. The total out-turn tables given in Chapter VI of Part I have been used for calculating the yield. In the Ulandi, Palakadavu, Perumkundru and Parayankadavu Blocks where no enumerations were carried out, the estimated yield has been calculated from figures of past out-turn collected from areas clearfelled during the past few years as explained in paragraph 526. The sub-joined statement gives the estimated yield from the clearfelling coupes in the Tunacadavu series.

Coupe number.	Teak.		Rosewood.		Miscellaneous Species.		Total.	
	Number of trees above 90 centimetres in girth at breast height.	Volume in cubic metres.	Number of trees above 90 centimetres in girth at breast height.	Volume in cubic metres.	Number of trees above 90 centimetres in girth at breast height.	Volume in cubic metres.	Number of trees above 90 centimetres in girth at breast height.	Volume in cubic metres.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
I	2,850	1,386·66	126	114·44	1,916	2,567·11	4,892	4,068·21
II	2,837	1,380·35	125	113·62	1,907	2,555·39	4,869	4,049·36
III	2,876	1,400·42	127	115·35	1,934	2,590·72	4,937	4,106·49
IV	2,824	1,374·24	125	113·30	1,898	2,544·35	4,847	4,031·89
V	2,824	1,374·24	125	113·30	1,898	2,544·35	4,847	4,031·89
VI	2,837	1.380·22	125	113·30	1,907	2,556 65	4,869	4,050·67
VII	2,824	1,374·24	125	113·30	1,898	2,544·35	4,847	4,031·89
VIII	2,721	1,326·12	119	109·30	1,826	2,452·49	4,666	3,887·91
IX	2,539	1,235·23	112	102·20	1,706	2,287·51	4,357	3,624·94
X	2,435	1,183.23	108	98·41	1,634	2,194·32	4,177	3,476·96
XI	2,643	1,287·79	116	106·91	1,778	2,379·79	4,537	3,774·49
XII	2,578	1,255·83	114	104·25	1,733	2,322·98	4,425	3,683·06
XIII	2,824	1,374·24	125	113·30	1,898	2,544·22	4,857	4,031·76
XIV	5	15-20	58	168·47	2.226	2,684·32	2,289	2,868·19
XV	5	15·20	56	164·60	2,184	2,634·39	2,245	2,814·19

SECTION 6—METHOD OF EXECUTING FELLINGS.

534. *The annual coupe and its lay out.*—The annual coupe will be demarcated on the ground in accordance with the felling series map, by cut lines 2 metres wide, except where the boundary is well defined by natural features. The survey and demarcation will be completed in September of the year prior to felling.

535. *Agency of exploitation.*—In the Tunacadavu series which contain valuable timber, exploitation of all timber will be done departmentally and the top ends left over will be sold in auction to contractors.

536. *Marking for felling.*—After the coupe survey is over, all saleable timber trees including dead and wind fallen ones (excepting those of softwood species) will be marked for felling. The trees will be blazed at ground level and at about 1.2 metres from the ground, and serial number chiselled on both blazes. The girth at breast height will be measured over-bark and the total length of saleable log in the bole will be ocularly estimated and the particulars entered in Form 2. An abstract of the enumeration register arranged in 30 centimetres girth classes for each species will then be prepared and the estimated volume of the marked trees arrived at with reference to the out-turn tables given in Chapter VI of Part I. These out-turn tables are based on local conversion practice and they do not take into account differences in length of utilisable bole so that errors usually made in estimating bole lengths will not influence the results. The District Forest Officer or his Assistant who will check the marking should satisfy himself that it has been satisfactorily executed; a 10 per cent check is suggested as the minimum. Marking and enumeration will be completed normally by December of the year previous to felling and the estimate of yield prepared in the following January so that estimates can be sanctioned and enumeration checked before felling starts on 1st April.

537. *Extraction scheme.*—An extraction scheme should be drawn up by the Range Officer for each coupe at the time of marking, showing the location of drag-paths, cart-tracks and depots on a map of 1 centimetre=.528 kilometres (12 inches=1 mile) scale. Cart tracks and drag paths must be laid out in such a way as to reduce dragging to the minimum. The scheme should be approved by the District Forest Officer in advance.

538. *Felling.*—Felling of saleable species will commence as early as possible after 1st April. Trees should be felled up-hill with as little wastage as possible.

539. *Logging*.—Logging must be done with the minimum of wastage. It must be entrusted to an experienced Forester and checked frequently by the Range Officer, the District Forest Officer and his Assistant. Logs above .70 cubic metres will require drag holes, but no snouting will be done as it involves wastage of timber and is not very necessary either. Rosewood logs will be dressed round by chipping off all bark and sapwood so as to expose the colour of the heartwood. *Lagerstromia lanceolata* is usually offered for sale in the round, with bark on, so as to minimise splitting. All round logs will be ringed at the middle of the log to enable the mid-girth to be measured under bark. Only defective logs will be rough-squared with a view to eliminate the defects as far as possible. Exceptionally large logs have some times to be halved with the saw to facilitate dragging and transport. Care should be taken to ensure that the saw cut is made at least 3 to 5 centimetres away from the centre heart, as exposure of the heart almost invariably results in bad splitting of both halves.

540. *Numbering of logs*.—All logs will be chisel numbered on conversion. The year of felling, coupe number, species, tree number (which must be the same as enumeration number) and log leter (A, B, C, etc., for the butt, second and third logs respectively) will be chiselled on each log. The portions of longitudinally sawn logs will be given numbers after the log letter.

541. *Extraction*.—All saleable timber should be felled, converted and dragged to the road-side from the clearfelling area by the end of October at the latest. Logs should be dragged to road-side depots soon after conversion. Forest depots should be situated under shade, and transport to Pollachi should be done as early as practicable so as to minimise deterioration through exposure.

542. *Transport*.—The transport of timber to Pollachi is usually done by lorries. The existing system of calling for tenders for such transport contracts will be continued.

543. *Classification of timber* :—The existing system of classification of timber followed in the division is described in detail in paragraph 163 of Part I. This system of classification is in the F.P.S. system. With the introduction of the metric system it has been decided to adopted an uniform system of grading timber all over the Southern States. A resolution to this effect has been passed at the conference of Forest Utilisation Officers of the Southern Region held at Madras during December 1963. The Forest Utilisation Officer, Madras is presently engaged in the task of standardising the classification in consultation with the Forest Utilisation Officers of the Southern States. The new system of classification and grading of timber may be followed when it comes into force. Until such time, the existing system of classification may be continued.

544. *Top ends*.—With a view to ensure complete utilisation of the trees in the coupe as possible, the District Forest Officer will sell the right to convert top ends of materials left in the coupe as also standing trees of softwood and fuel species in public auction in February-March annually with a *voidah* of 9 months from 1st April. No extension of *voidah* will be granted under any circumstances. In order to reserve sufficient material on the ground to ensure a satisfactory burn, the existing practice of prohibiting removals of bamboos *in toto*, and twigs and branches of tree species below 90 centimetres in girth will be continued.

SECTION 7.—TABULAR STATEMENT OF FELLINGS.

545. The following statements show details of the coupes to be felled and planted annually during the next ten years in each of the felling series included in the Teak Plantation Working Circle. Coupes to be worked for the next 5 years are also given in case the revision of the working plan is not taken up in time. If a coupe of a given number lies in one or more isolated bits, the sub-coupes are designated by suffixing letters, 'a', 'b', etc., to the coupe number.

TUNACADAVU FELLING SERIES.

Year of clear felling. (1)	*Year of planting.* (2)	*Coupe number.* (3)	*Compartments in which the coupe occurs.* (4)	*Area in hectares.* (5)	*Remarks.* (6)
1965–66	1967	I	Ulandi 86,90	86·0	
1966–67	1968	II	Ulandi 89,90	87·5	
1967–68	1969	III	Ulandi 89,90	87·5	
1968–69	1970	IV	Ulandi 88,89	88·0	
1969–70	1971	V	Ulandi 88,89	88·0	
1970–71	1972	VI	Ulandi 88	88·5	
1971–72	1973	VII	Ulandi 86	88·0	
1972–73	1974	VIII (*a*)	Ulandi 85,86	60·5	
		VIII (*b*)	Perumkundra 9	18·0	
		VIII (*c*)	Perumkundru 10	7·0	
			Palakadavu 91		
1973–74	1975	IX	Palakadavu 93, 94	79·0	
1974–75	1976	X (*a*)	Palakadavu 94	41·5	
		X (*b*)	Palakadavu 94, 95	35·0	
1975–76	1977	XI	Palakadavu 105	82·5	
			Perumkundru 13		
1976–77	1978	XII (*a*)	Palakadavu 105	36·5	
		XII (*b*)	Palakadavu 99, 100	44·0	
1977–78	1979	XIII	Palakadavu 98	88·0	
1978–79	1980	XIV	Mount Stuart 52, 74, 75.	87·0	
1979–80	1981	XV	Mount Stuart 71, 75 to 77	85·0	

546. The annual area to be clearfelled has been marked on the management maps prepared and appended to this plan.

SECTION 8—REGULATION OF REGENERATION OPERATIONS.

547. *Preparation of the planting sites.*—(*a*) *Burning.*—Soon after the contractor has vacated the coupe, all the regrowth will be cut back and allowed to dry. The felling slash and cut materials will be evenly spread all over the area and burnt during February. The unburnt materials will be billeted, piled in scattered heaps over unburnt patches and reburnt by the 15th of March. Both these operations will be done under supervision. The desirability of obtaining a good and even burn over the whole area in the first instance itself is stressed. Piling and reburning are expensive operations and should be reduced to the minimum possible.

(*b*) *Aligning and staking.*—The espacement will be 1.8 metres x 1.8 metres. The regeneration areas will be aligned and staked by the end of March

(*c*) *Planting.*—Planting of teak should be done preferably during the premonsoon showers as soon as the ground becomes sufficiently moist to make crow-bar holes deep enough to admit the stumps. In the Anamalais, pre-monsoon showers are received generally after the 1st of May, although earlier showers are not altogether uncommon. One year old stumps about 25-1/2 centimetres long with 23 centimetres of root and 2-1/2 centimetres of shoot, and 1 to 2 centimetres thick at the collar prepared from nursery raised seedlings should be used. The stumps should be planted firmly in crow-bar holes flush with the ground level, but if the soil is likely to be washed away during the rains, 1 centimetre below the ground is preferable. The soil should be well compacted taking care not to leave any air space between the stumps and the soil. Original planting will be done always on one definite side of the stake and replacements on the other.

548. Stump planting of other miscellaneous species like Rosewood *Terminalia tomentosa and Pterocarpus marsupium* will be done at the same time as teak, but *Eucalyptus grandis* will be planted in container plants a little later when the first showers of the south-west monsoon are received. The containers will be removed while planting without in any way disturbing the ball of earth around the plants. Both teak and the other species will be grown pure, except in transitional zones of doubtful areas, when both teak and one of the secondary species will be planted at the same stake.

549. *Kumri.*—In the Tunacadavu Range, *kumri* is presently indulged in only a small fraction of the area by elephant-men stationed at Varagaliar. For the major portion of the regeneration area there is no demand for *kumri*, as villagers from the plains are reluctant to take up cultivation due to fear of damage of crops by wild elephants and gaur. Prescriptions for the growing of Camphor Tulsi [*Ocimum kilimandscharicum*] in these areas are made elsewhere.

SECTION 9—NURSERY.

550. Nurseries will be required for raising stumps of teak, *Terminalia tomentosa, Dalbergia latifolia* and *Pterocarpus narspium,* and container plants of *Eucalyptus grandis.*

551. *Seed collection and storage.*—Excepting in the case of the exotic *Eucalyptus grandis* where seeds have to be necessarily procured from elsewhere, local seeds should be preferred for all the indigenous species. Since many of characteristics of teak are probably hereditary, it is essential that seed should be collected only from trees of good, straight growth and form. Trees of twisted grain or of low branching habit should be avoided for seed collection. Seeds should be collected preferably from trees above 20 years of age, as seeds collected from immature or even very old trees are said to have a lower germination per cent. In the case of teak where older plantations exist, trees of plantation origin should be preferred as they are generally straight grown and are of known age and better progeny.

552. In the case of *Eucalyptus grandis*, the present source of seed supply is either from Munnar or the Anamalais where it is grown in some of the estates. The Munnar plantations have been known to freely hybridise with the closely allied *Eucalyptus robusta*, a species which has also been raised over a fairly large extent in this area. *Eucalyptus robusta* is a species considered to be more suitable in filling in swamps but relatively less useful as an industrial raw material. There is therefore the danger of the hybrid deriving the undesirable characteristics of *Eucalyptus robusta.* The *hybridisation* is not of any consequence if the object of growing *Eucalyptus grandis* is for fuelwood, but if the object of management is to produce pulpwood, it is of vital importance to plant pure *Eucalyptus grandis* until pulping tests of local grown material of *Eucalyptus robusto* and the Munnar hybrid are obtained. Even in the Anamalais, there are several small scattered plantations of *Eucalyptus robusta* sufficient to cross-pollinate with the *Eucalyptus grandis* mother trees to produce a good percentage of hybrid seeds. Pollination in the genus Eucalyptus is essentially by need which are said to travel a distance of 7 miles as the crow flies. As such it will be difficult to imagine that the Anamalai seeds would be pure either. Initial planting should be therefore made with seeds of *Eucalyptus grandis* obtained directly from Australia through the Silviculturist. Requirements of *Eucalyptus grandis* seeds in the Tunacadavu Range are not likely to be large and about 100 grams are at the most required for raising one or two beds of seedlings. Plants raised from this seed stock are bound to fruit in 4 or 5 years, when they can be used as seed sources for further seed supply as there are not many chances for contamination from *Eucalyptls robusta.* A few plants of *Eucalyptus grandis of Mannar origin* put out to fill moister locations in the 1962 and 1963 teak plantations at Varagaliar have shown ' robusta ' characteristics apparently due to hybrid stock. These plants may be therefore uprooted before they flower, in order to prevent chances of any hybridication.

553. The nursery technique for *Eucalyptus grandis* is described separately, while that for the other species will be as follows :—

554. The following table indicates the time for seed collection for the species suggested for planting :—

Serial Number. (1)	*Species.* (2)	*Time for collection of seed.* (3)
1.	Tectona grandis	January–February.
2.	Terminalia tomentosa	February–March.
3.	Dalbergia latifolia	February–March.
4.	Pterocarpus marsupium	January–March.

555. Seeds may be conveniently collected by clearing the ground under the trees, and the branches lightly beaten off by means of long sticks. The dry outer cover of the fruit should be removed soon after collection. All the seeds will be dried and stored in gunnies under cover in airy rooms.

556. *Nursery site.*—The practice of forming nurseries in regeneration areas will be continued. A temporary nursery has definite advantages over a permanent one by reducing the cost of transport of stumps besides reducing the damage by cockchafers. The number and quality of stumps produced will be also definitely superior owing to the virgin soil. Since two year old stumps give at least as good results as one year old ones, it will be convenient and economical to utilise stumps available in the second year in a nursery, the large plants being used up at the end of the first year and the smaller ones retained in the nursery during the second year. All nursery sites should be approved by the District Forest Officer.

557. *Formation of beds.*—The nursery beds will be formed in April-May as soon as the pre-monsoon showers are received, after digging up the site to a minimum depth of half a metre. Standard beds of 12.2 metres x 1.2 metres size will be formed, leaving an intervening space of half a metre between successive beds to facilitate watering, weeding and inspection. The beds will be raised about 20 centimetres high, supported at the sides by split bamboos, poles or other convenient material, so as to ensure good drainage. The beds will be laid along the contour and not across it. The surface of the beds will be given a slight camber to prevent stagnation of water. No shading of the beds will be normally required.

558. *Size of nursery.*—Two and half beds of standard size are reckoned as sufficient for raising one hectare of plantation of teak or *Terminalia tomentosa* as the case may be at an espacement of 1.8 metres x 1.8 metres. A few additional beds should be formed to provide for replacement of casualties. Of the other species, *Dalbergia latifolia* and *Pterocarpus marsupium*, about 1,800 stumps may be expected from a standard bed which will allow for six hectare planting at the same espacement.

559. *Sowing.*—The present practice of sowing about 12 kilograms of teak seed per bed will be continued. A similar quantity is necessary in the case of *Terminalia tomentosa*. For the other two species (*Dalbergia latifolia and Pterocarpus marsuptium*). 1 bag of seeds (225 litres) will be necessary for a standard bed.

560. No pre-treatment before sowing is needed either for teak of for *Terminalia tomentosa*. The pods of *Dulbergia latifolia* should be broken up before sowing and those of *Pterocarpus marsupium* soaked for 48 hours in an emulsion of cow-dung and water.

561. The seeds will be sown early in April and covered with a layer of fine soil to a depth equal to the thickness of the seed. The sowing will be done in separate beds for each of the species. The beds will then be covered with scattered twigs of *Emblica officinalis* or similar light leaved material and finally a layer of straw. The twigs will prevent the straw being washed into the soil and facilitate removal of the straw without damaging the germinating seeds. As soon as germination is observed, the straw must be removed. If there is no sufficient rain after sowing, watering will be necessary until the seeds sprout.

562. *Weeding.*—The nursery beds will be kept clean weeded and the soil loosened between plants as and when necessary. Efforts should be made right from the beginning to raise seedlings of an uniform height. In order to achieve this, the few more robust seedlings or 'wolves' if any will be removed in order to prevent suppression of the rest.

563. *Preparation of stumps.*—Teak stumps with a diameter range of 1 to 2 centimetres at the collar give the best results both as regards survival percentage and growth. Two year old stumps can be also used provided they are within the diameter range prescribed above. The nursery beds should be watered before the seedlings are pulled out.

Removal should begin at one end of the bed and proceed towards the other end. A sufficient number of seedlings will be left in the beds to stock the nursery site at an approximate espacement of 1.8 metres into 1.8 metres. The seedlings should be removed one at a time, by holding them as near the ground as possible and gently pulled after loosening the soil by a pick-axe as and when necessary.

564. In preparing stumps it is essential to use a sharp knife. All small side roots should be trimmed off flush with the main root and the stem cut about 2-1/2 centimetres above the collar; 23 centimetres of root should be left as per standard procedure. Stumps for the secondary species will be prepared in a similar manner as for teak.

565. The nursery technique for *Eucalyptus grandis* is described below :—

For reasons mentioned earlier, *Eucalyptus grandis* seeds will be obtained directly from Australia through the Silviculturist for at least another five years. Beds of the standard size will be prepared just as for teak early in October. A couple of beds will be sufficient for each regeneration area. *Eucalyptus grandis* seeds being tiny will be mixed with fine sand and broadcast sown over the beds. The seedlings require to be shaded from the sun.

566. When the seedlings are 2-1/2 to 5 centimetres high, they will be pricked out to polythene containers. Containers 23 centimetres long and 7-1/2 centimetres in diameter of 150 guage are quite ideal. The conitainers will be watered and kept under shade until the plants strike root. Thereafter, they may be kept in the open and watered sparingly, in order to prevent them from growing too tall. The seedlings will be 15 to 25 centimetres tall by May, when they will be ready for transplanting.

SECTION 10—SUBSIDIARY SILVICULTURAL OPERATIONS.

567. *Replacement of casualties.*—Casualties in the year of planting will be replaced as soon as possible after they occur till the end of August. Individual casualties in the second year will not be replaced, but extensive areas of failure should be replanted with teak, provided the District Forest Officer is satisfied that the failure was not due to swampy conditions.

568. *Tending.*—(*a*) *First year.*—During the first year, the plantation will need frequent and intensive weedings. During each weeding all growth other than teak will be cut back and *Lantana* and bamboo uprooted. Climbers will also be cut back at every weeding. Generally, 6 weedings will be required during the five year i.e., first weeding from the middle of June, second from the middle of July, third during the middle of August, fourth during the middle of September, fifth early in November and a sixth late in December.

Seedlings damaged by *Dihammus*, wind, elephants or other causes will be promptly cut back at ground level as soon as the damage is noticed. Multiple shoots in any seedling should be reduced to one leader.

(*b*) *Second year.*—During the second year, three weedings will be done combined with climber cutting and uprootal of *Lantana* and bamboo. The first weeding will be done in May, the second in August and the third in November. A scrape weeding to a width of .6 metre around the plants will be combined with the first weeding.

As in the first year, all damaged plants will be cut back and multiple shoots reduced to one leader. A general pruning or debudding over the entire plantation up to a height of 2 metres along with the first weeding will also be done. The debudding will consist of removal of tender buds and branches which will come off by applying a little pressure with the hand without resorting to a bill-hook. Woody branches need not be cut as the timber is likely to develop defects. In order to prevent this, the debudding should be done early without allowing the branches to grow woody.

(*c*) *Third year.*—One tending is prescribed during the third year. This will consist of cutting back all damaged teak saplings, cutting of climbers and bamboos. A pruning or debudding may be also done along with this tending, if necessary.

569. *Inter-planting of cover crops.*—In order to combat the weed menace which is very heavy in the young teak regeneration areas of Tunacadavu Range and also possibly make a multiple use of the soil, it is suggested that a suitable cover crop may be inter-planted during the second year. The Camphor Tulsi (*Ocimum kilimandscharicum*) seems to come up very well in the Tunacadavu Range. The species was inter-planted on a small scale during the past few years in the younger teak plantations with gratifying success. A trial distillation of the leaves collected was also made at the Government Quinine Factory at Cinchona. The results of the trial distillation are discussed under Chapter VI of Part I. The yield obtained compares favourably with average standards and it is probable that it would be more when the collection and distillation are organised systematically. There is at present a keen demand for camphor both in industry and places of worship and nearly half of the country's requirements are met from foreign imports. The cultivation of camphor will therefore help in saving foreign exchange not to speak of the other incidental benefits such as more revenue, reduction in weeding costs, etc. Camphor cultivation is therefore recommended for interplanting in the teak plantations of Tunacadavu Range, where there is no possibility for *kumri*.

570. *Planting technique.*—Past experience in the Coimbatore Circle has proved that *Ocimum* is best introduced in the 2nd year of the teak plantation so that it may not suppress the teak. Planting of 1 seedling in quincunx has been found to be the best when grown as a cover crop as this gives enough space for the *Ocimum* plant without causing any interference to the teak. Planting of 1 month old nursery raised seedlings 10 to 15 centimetres in height during the monsoon has been found to be the best method of planting.

571. *Harvesting.*—Three crops can be harvested annually until the teak crop is about 4 years old. By this time the teak canopy would sufficiently close. It has been found that coppicing the plants down to ground level is better than plucking leaves, both from the point of easy collection and also less of interference to the teak plants. The details of the method of harvesting and distillation are described in the chapter on Minor Forest Produce Working Circle. The *Ocimum* plants can be eradicated during the first thinning.

572. *Thinnings.*—The thinning cycle and intensities for the Tunacadavu and Punachi Series are prescribed separately, as the rate of growth and stocking in these series vary considerably to necessitate the adoption of separate methods.

(*a*) *Tunacadavu Series.*—(i) *Thinning cycle.*—Thinning will be carried out at the ages of 4, 7, 12, 20 and 29 years. The thinning cycle prescribed is the same as adopted currently in the division. The final thinning will be carried out at the age of 40 years as suggested by Bhoja Shetty in the areas where the rotation is 80 years.

(*ii*) *Thinnning degree or grade.*—Since the site quality would not assert itself until the plantations are at least 10 years old, selective thinnings are prescribed only after this age. The first two thinnings will be therefore prescribed to be mechanical consisting of the removal of the alternate diagonal and the alternate planting lines. The subsequent thinning will be prescribed to be selective.

The thinning degree for the first 2 mechanical thinnings will be expressed as an S—percentage of the top height. The first mechanical thinning will be carried out by removing all the plants in the alternate diagonal rows, by which an espacement of 2.55 metres × 2.55 metres and reduction in the stocking by 50 per cent would result. The second mechanical thinning will consist of removal of all the plants in the alternate planting lines by which an espacement of 3.6 metres × 3.6 metres would result with a reduction in the stocking by a further 50 per cent.

For the subsequent thinnings which will be silvicultural, a D Grade intensity is prescribed as against the current practice of thinning to F grade, since heavy thinnings followed by damage by elephants (which is a common feature) often causes lasting gaps in the canopy.

(*b*) *Punachi Series.*—In view of the comparatively poor growth in the Punachi plantations, it would be unwise to adopt the thinning cycle or the intensity prescribed for the Tunacadavu plantations. Even during the past twenty years, the regular thinning cycles prescribed in the last two working plans could not be followed rigidly because of the poor quality of the plantations, and the thinnings were generally postponed or deferred. The following thinning cycle is therefore prescribed :—

Thinnings will be carried out at the ages of 5, 12 and 20 years. All the thinnings will be selective and not mechanical. A ' C ' grade intensity will be adopted. Higher grades of thinning are not advocated for these poor plantations.

573. *Marking rules for thinning.*—(*i*) The mechanical thinnings will be carried out by the Range Officer.

(*ii*) Marking for the silvicultural thinnings will be done by the District Forest Officer or his Gazetted Assistant. Every tree to be felled will be marked with his personal hammer by a basal blaze, so that the authority for its removal will be apparent even after the tree is extracted. Felling of marked stems should follow closely on the marking itself so that the marking officer can immediately see for himself the results of his marking.

(*iii*) A climber cutting and removal of *Dendrophtroe or* other parasites on the tree should precede every thinning and the marking officer should ensure that these operations have been carried out properly before he commences marking. The parasites should be effectively destroyed, preferably by burning.

(*iv*) While marking, teak of course should receive preference, but good stems of the secondary species (*Terminalia tomentosa*, *Dalbergia latifolia*, *Pterocarpus marsupium* and *Eucalyptus grandis*) should not be sacrificed for a poorer stem of teak as the latter are also valuable.

(*v*) Suppressed stems or saplings of miscellaneous species forming a natural understorey should not be cut unless they interfere with the teak, as they are expected to form a soil cover and assist in the biological control of defoliators.

(*vi*) In the Punachi Series, small patches of miscellaneous species have been raised in the past within the annual teak regeneration area. Such areas will also be thinned along with the teak adopting the same intensity of thinning, until a better knowledge of the growth of these species is learnt.

(*vii*) The stems to be retained at the final thinning will be the stems required for the final crop plus 10 per cent to allow for the natural loss between the final thinning and the rotation age.

574. The following tables give the number of stems to be retained at every silvicultural thinning for C and D grade intensities for the different site quality classes, as could be gathered from the Revised Yield and Stand Tables for Plantation Teak (Indian Forest Records, New series, Volume 9, No. 4). These figures will only serve as a guide to the marking officer as the intensity of thinnings to be adopted will depend on condition in the field.

(*a*) TUNACADAVU SERIES (D GRADE INTENSITY).

Age at thinning.	*Number of stems per hectare.* *Site qualities.*						
	I	*I/II*	*II*	*II/III*	*III*	*III/IV*	*IV*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
12	424	486	580	666	800	920	1,130
20	224	244	298	350	439	536	686
29	126	155	190	237	395	454	496

(*b*) PUNACHI SERIES (C GRADE INTENSITY).

Age at thinning.	*Number of stems per hectare.* (*IV quality only*).
5	2,096
12	1,414
20	856

575. *Thinning programme.*—The following statement gives details of the areas to be thinned during the ten year period of this plan. Particulars of areas that will have to be thinned for the next 5 years is also given, in case the revision of the working plan is not taken up in time.

Year of thinning. (1)	*Name and year of the plantation.* (2)		*Compartments in which the plantation occurs.* (3)	*Area of the plantation in hectares.* (4)
1965–66	Tunacadavu (P. S. Plantation).	1936	Mount Stuart 65	2.02
	Tunacadavu	1958	Ulandi 82	35·21
	Do.	1961	Ulandi 83, 85	82·96
	Punachi	1945	Punachi 5	5.06
	Do.	1960	Punachi 3, 4, 6 Waterfall 6, 7	21.85
1966–67	Tunacadavu (P. S. Plantation).	1937	Mount Stuart 65	2.02
	Tunacadavu	1959	Ulandi 82, 83	25.50
	Do.	1962	Ulandi 83, 85	81.34
	Punachi	1946	Punachi 9	13.56
	Do.	1961	Waterfall 2, 3, 4	19.83
1967–68	Tunacadavu	1963	Ulandi 84, 85, 87	79.32
	Do.	1960	Ulandi 83, 85	72.84
	Punachi	1947	Punachi 13	13.46
	Do.	1962	Waterfall 2, 3, 4	19.83
1968–69	Tunacadavu	1961	Ulandi 83, 85	82.96
	Do.	1964	Ulandi 82, 84, 87	95.51
	Punachi	1948	Punachi 13	11.29
	Do.	1963	Waterfall 2, 3	18.21
1969–70	Tunacadavu	1957	Ulandi 81	33.99
	Do.	1962	Ulandi 83, 85	81.34
	Do.	1965	Ulandi 81, 84, 87	..
	Punachi	1949	Punachi 7	9.31
	Do.	1957	Punachi 6	23.47
1970–71	Tunacadavu	1958	Ulandi 82	35.21
	Do.	1963	Ulandi 84, 85, 87	79.32
	Do.	1966	Ulandi 84, 87	..
	Punachi	1950	Punachi 7	10.72
	Do.	1958	Punachi 6	19.83
1971–72	Tunacadavu	1959	Ulandi 82, 83	25.50
	Do.	1964	Ulandi 82, 84, 87	..
	Do.	1967	Ulandi 86, 90	..
	Punachi	1959	Punachi 6 Waterfall 7	22.26
1972–73	Tunacadavu	1960	Ulandi 83, 85	72.84
	Do.	1965	Ulandi 81, 84, 87	..
	Do.	1968	Ulandi 89, 90	..
	Punachi	1960	Punachi 3, 4, 6 Waterfall 6, 7	21.85
1973–74	Tunacadavu	1961	Ulandi 83, 85	82.96
	Do.	1966	Ulandi 84, 87	..
	Do.	1969	Ulandi 89, 90	..
	Punachi	1961	Waterfall 2, 3, 4	19·83
1974–75	Tunacadavu	1962	Ulandi 83, 85	81·34
	Do.	1967	Ulandi 86, 90	..
	Do.	1970	Ulandi 88, 90	..
	Punachi	1962	Waterfall 2, 3	19.83
1975–76	Tunacadavu	1963	Ulandi 84, 85, 87	79.32
	Do.	1968	Ulandi 89, 90	..
	Punachi	1963	Waterfall 2, 3	18.21
1976–77	Tunacadavu	1964	Ulandi 82, 84, 87	..
	Do.	1969	Ulandi 89, 90	..
	Do.	1972	Ulandi 88	..
1977–78	Tunacadavu	1957	Ulandi 81	33.99
	Do.	1965	Ulandi 81, 84, 87	..
	Do.	1970	Ulandi 88, 29	..
	Tunacadavu	1973	Ulandi 86	..
	Punachi	1957	Punachi 6	23.47
1978–79	Tunacadavu	1958	Ulandi 82	35.21
	Do.	1966	Ulandi 84, 87	..
	Do.	1971	Ulandi 86, 88	..
	Do.	1974	Ulandi 85,86, 91 Perumkundru 9, 10	..
	Punachi	1958	Punachi 6	19.83

Year of thinning. (1)	Name and year of the plantation. (2)		Compartments in which the plantation occurs. (3)	Area of the plantation in hectares. (4)
1979-80 ..	.. Tunnacadavu ..	1959	Ulandi 82, 83	25.50
	Do. ..	1967	Ulendi 86, 90	..
	Do. ..	1972	Ulandi 88	..
	Do. ..	1975	Palakadavu 93, 94	..
	Punachi ..	1959	Punachi 6 Waterfall 7	22.26

NOTE.—The areas of plantations yet to be formed are not noted as it would be improper to furnish them now.

576. *Exploitation of thinned produce.*—The thinned produce will be converted into poles if their girth at butt-end exceeds 90 centimetres, adopting the following classification now in vogue in the division :—

(i) Poles below 30 centimetres in girth at butt-end.

(ii) Poles above 30 centimetres and below 45 centimetres in girth at butt-end.

(iii) Poles above 45 centimetres and below 60 centimetres in girth at butt-end.

(iv) Poles above 60 centimteres and below 75 centimetres in girth at butt-end.

(v) Poles above 75 centimetres and below 90 centimetres in girth at butt-end.

577. Trees with a butt-end diameter of over 30 centimetres will be treated as logs and measured in volume and sent to Pollachi Timber Depot for sale. Before conversion trees suitable for electric transmission poles will be separated and converted according to the prescriptions laid down by the Forest Utilisation Officer and made available to the State Electricity Board, under his directions. The rest of the poles will be sold in auction at site.

578. Miscellaneous growth and top ends of teak will be converted into fuel, since there will be a demand for fuel which is bound to increase when the present large scale disafforestation for the Parambikulam-Aliyar Project will cease. The converted fuel will be stacked in sizes of 2 metres by 1 metre by 1 metre and sold at site.

SECTION 11—OTHER REGULTAIONS.

579. *Plantation boards* :—Every plantation should carry at the salient corners of its periphery, conspicuous boards showing the calendar year of its formation and its area. Such of these boards that require replacement will be renewed in the month of April every year.

580. *Inspection paths* :—Permanent and properly graded inspection paths 2 metres wide, will be formed in each plantation and kept clean of all growth to facilitate inspection.

581. *Closure to grazing* :—All areas included under this working circle will be closed to grazing *ad infinitum* as they are extremely valuable.

582. *Fire protection* :—All plantations will be protected against fire by an exterior line 6 metres wide, which will be cut and burnt every year, and by the annual clearing of internal boundaries between plantations to a width of 3½ mertes. All burning of fire lines should be completed by the 31st January. Late burning of fire lines may result in serious fires in the plantations. It is therefore better not to burn the fire lines at all rather than do late burning.

SECTION 12—CONTROL.

583. A control book, record of works, register of deviations, control journal, control maps, plantation and nursery journals will be maintained for this working circle. The manner in which these records are to be maintained are indicated in Sections 22 and 23 under the chapter on Miscellaneous Regulations.

CHAPTER III—WORKING PLAN FOR THE EVERGREEN SELECTION WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

584. *Objects of management.*—The main object of this working circle is to exploit the commercially saleable species in the evergreen forests of this division, primarily for the production of railway sleepers, but without in any way disturbing the essentially evergreen nature of these forests.

585. *General constitution of this working circle.*—This working circle will comprise of the tropical wet evergreen forests in the Italiar, Manamboli and Varagaliar Valleys that contain a suitable proportion of mature and over-mature trees of evergreen species suitable for the production of railway sleepers. The Karianshola forest in the Tunacadavu Range which was included in the previous plan has been deleted from this working circle for the following reasons :—

(i) Nearly one half of this forest has been transferred to the Kerala State following ' States Reorganisation '.

(ii) About a half of the portion left in this state consists of the All-India Linear Increment Plot and several smaller research plots under the care of the Silviculturist.

586. What little is left is not worthy of consideration for exploitation. It is considered best to leave this small patch of forest as a botanical garden.

587. *Area.*—The area of this working circle is 1,330 hectares.

588. *Character of the vegetation.*—The forests included in this working circle essentially conform to the type—1a Southern tropical wet evergreen forests—C.3 Western tropical evergreen—as per the classification of Champion. The chief tree species in this type of forest are *Mesua ferrea*, *Calophyllum elatum*, *Cullenia rosayroana*, *Palaquium ellipticum*, *Canarium strictum*, *Poeciloneuron indicum*, *Artocarpus heterophyllus*, *Ailanthus triphysa*, *Dysoxylum malabaricum*, *Vateria indica*, *Vatica chinensis*, etc. The distribution of species varies from place to place, certain species often seldom seen or even completely absent in certain localities.

589. Two distinct associations are noticed in the forests included in this working circle—

(i) The *poeciloneuron—Gullenia Mesua* association noticed in portions of the Italiar and Kallar Blocks.

(ii) The *Mesua—Cullenia* association occurring in portions of the Italiar Block.

(iii) The *Vateria—Calophyllum* association occurring in portions of the Manamboli and Varagaliar Valleys.

590. *In the Poeciloneuron—Gullenia—Mesua* association, *Poeciloneuron indicum* forms about 60 per cent of the overwood. *Mesua ferrea* and *Cullenia rosayroana* come next each constituting about 15 per cent of the overwood. The *Mesua–Gullenia* association occurs along the ridges in the Italiar valley where *Poeciloneuron indicum* only sporadically occurs. In the *Vateria-Calophyllum* association, *Vateria indica* and *Calophyllum elatum* are the two dominant species. This association occurs typically in the river valleys of the Palakadavu Block. A detailed description of the forest type and the associations met with is given in Chapter II of Part I.

SECTION 2—BLOCKS AND COMPARTMENTS

591. The areas included in this working circle lie in portions of Italiar 4 to 7, Kallar 22, 25, Parayankadavu 1 and 2, Palakadavu 102 to 104, and Perumkundru 9. The details of the areas included under this working circle in each of these compartments are given in Appendix I and shown on the concerned management maps.

SECTION 3—DIVISION OF THE AREA

592. *Division into felling series.*—The working circle will consist of one felling series which will be known as the Punachi Felling Series, since bulk of the areas constituting it form part of the Punachi Range.

SECTION 4—ANALYSIS AND VALUATION OF THE CROP

593. *Stockmapping.*—All areas proposed for inclusion in this working circle have been ocularly stockmapped and only such of those areas found to contain at least 7 to 10 trees per hectare of the commercially valuable species with a girth limit exceeding the exploitable girth fixed for this working circle have been included, in order to ensure economic exploitation. The following evergreen species which are presently accepted by the Railways as suitable for sleepers were alone reckoned—*Mesua ferrea, Poeciloneuron indicum, Calophyllum elatum, Cullenia rosayroana, Palaquium ellipticum, Vateria indico, Hopea parviflora* and *Canarium strictum*.

594. *Enumerations.*—In order to estimate the yield from each annual coupe, a 10 per cent enumeration of the area was made by the method of ' stratified random sampling '. The enumeration technique adopted and the data collected are tabulated in Chapter VI of Part I.

SECTION 5—METHOD OF TREATMENT

595. *Silvicultural system.*—The forests will be worked by a system of light selection fellings whereby only mature and over-mature trees of saleable species over a minimum prescribed girth limit will be removed, without in any way altering the evergreen character of these forests.

596. No artificial regeneration measures are proposed as the technique of regenerating evergreen species is still not fully understood.

597. *Exploitable species.*—The following evergreen species occurring in these forests are presently accepted by the Railways for production of Railway track sleepers—*Mesua ferrea, Poeciloneuron indicum, Calophyllum elatum, Hopea parviflora, Palaquium elliptiqum, Cullonia rosayroana, Vateria indica* and *Canarium strictum*. In addition to the above demand species such as *Dysoxylum malabaricum. Cedrela toona* and *Artocarpus heterophyllus* have a good demand as round logs and *Ailanthus triphysa* for the match industry. If there is a demand for any of these species, they may also be marked for felling provided they are of the exploitable girth fixed in paragraph 599, but subject to the condition that the maximum number of trees per hectare to be removed will not exceed the scale fixed in paragraph 608.

598. Some of the sleeper species noted above, especially *Mesua ferrea, Hopea parviflora. Palaquium ellipticum, Vateria indica* and *Canarium strictum* have a good demand for other purposes also. For instance, *Hopea parviflora* and *Palaquium ellipticum* have a good demand for sizes, while *Vateria indica* and *Canarium strictum* have an equal if not keener demand in the plywod and matchwood industries. But since the demand for railway track sleepers is for a Government undertaking of national importance and is such more than the division can supply, the release of such timber for sale in the open market has to be curtailed.

599. *Exploitable girth.*—A girth limti of 2.13 metres at breast height was adopted in the past plan. Rounding this off to a more convenient figure, viz., 2.10 metres will be fixed as the exploitable girth, since trees above this girth limit have a tendency to become unsound in most of the species.

600. *Rotation.*—No data being available to determine the rate of growth of evergreen species, a rotation of 150 years was tentatively adopted in the last plan with the assumption that a girth of 2.13 metres will be attained at this age. In the absence of any further data, the same period will be adopted for this plan too.

601. *Felling cycle.*—Although silviculturally it is desirable to have a shorter felling cycle, from the management point of view this results in too large an area for annual exploitation which will be difficult for supervision and exploitation. A felling cycle of 30 years was therefore adopted in the past plans. The same period will be adopted during this plan too.

602. *Regulation of the yield.*—The yield will be regulated by area, the area of the annual coupe being determined by dividing the total area of the felling series by the felling cycle.

603. *Estimate of yield from the annual coupe.*—An estimate of the number of exploitable trees that will be available from each coupe and the probable out-turn has been made on the basis of enumerations done as referred to in paragraph 594. The local out-turn tables given in Chapter VI of part I have been used for calculating the volue of timber. For species for which out-turn tables are not available, the data for *palaguium ellinticum* has been adopted. The probable sleeper out-turn in B.G. units has also been calculated for each of the sleeper species. The following statements give details of the estimated yield in each coupe species-wise.

Species.	*Number of exploitable trees.*	*Volume in cubic metres.*	*Sleeper out-turn in B.G. Units.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)
		COUPE I		
Mesua ferrea	183	664·26	4,436·40	
Palaquium ellipticum	96	312·31	2,184·90	
Poeciloneuron indicum	223	867·10	4,364·40	
Cullenia rosayroana	137	568·94	3,923·90	
Vateria indica	9	29·58	207·20	
Dysoxylum malabaricum	19	61·03	—	
Artocarpus heterophyllus	21	70·88	..	
Ailanthus triphysa	1	2·20	..	
		COUPE II		
Mesua ferrea	180	682·53	4,400·00	
Calophllyum elatum	19	77·80	544·90	
Palaquium ellipticum	72	239·86	1,686.30	
Poeciloneuron indicum	224	997·90	5,261·20	
Cullenia rosayroana	107	455·08	3,134·60	
Canarium strictum	3	13·00	83·40	
Vateria indica	6	21·27	150·20	
Dysoxylum malabaricum	13	40·33	..	
Artochrpus heterophyllus	15	47·66	..	
Ailanthus triphysa	1	2.20	..	
Cedrela toona	2	4·97	..	
		COUPE III.		
Mesua ferrea	180	662·53	4,440·00	
Calophyllum elatum	19	77·80	544·90	
Palaquium ellipticum	72	239·86	1.686·30	
Poeciloneuron indicum	224	997·90	5.261·00	
Cullenia rosayroana	107	455·08	3134·60	
Canarium striotum	3	13·00	83·40	
Vateria indica	6	21·27	150·20	
Dysoxylum malabaricum	13	40·33	..	
Artocarpus heterophyllus	15	47·66	..	
Ailanthus triphysa	1	2·20	..	
Cedrela toona	2	4·97	..	

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Species. (1)	*Number of exoploitable trees.* (2)	*Volume in cubic metres.* (3)	*Sleeper out-turn in B. G. units* (4)	*Remarks.* (5)
COUPE IV				
Mesua ferrea	178	639·92	4,273·70	
Calophyllum elatum	19	77·80	524.90	
Palaquium ellipticum	73	242·63	1,705.30	
Poeciloneuron indicum	191	877.67	5,297.50	
Cullenia rosayroana	111	471·68	3,249.30	
Canarium strictum	4	15.85	103.60	
Vateria indica	8	26·85	160·60	
Dysoxylum malabaricum	15	47.71	..	
Artocarpus heterophyllus	18	58.58	..	
Ailanthus triphysa	2	4·97	..	
Cedrela toona	4	9·94	..	
COUPE V				
Mesua ferrea	180	662.58	4,440.00	
Calophyllum elatum	19	77·80	544·90	
Palaquium ellipticum	72	239·86	1,686.30	
Poeciloneuron indicum	224	997 90	5,261.00	
Cullenia rosayroana	107	455.08	3,134·60	
Canarium strictum	3	13.00	83.40	
Vateria indica	6	21.27	150·20	
Dysoxylum malabaricum	13	40·33	..	
Artocarpus heterophyllus	15	47·66	..	
Ailanthus triphysa	1	2.20	..	
Cedrela toona	2	4.97	..	
COUPE VI				
Mesua ferrea	112	394·12	2,617·20	
Palaquium ellipticum	14	40.94	282·20	
Poeciloneuron indicum	357	1,874.60	8,849·10	
Cullenia rosayroana	99	442·85	3,032.40	
Artocarpus heterophyllus	8	28·19	..	
Ailanthus triphysa	3	10·55	..	
COUPE VII				
Mesua ferrea	129	460.37	3,070.80	
Calophyllum elatum	3	7·65	59.40	
Palaquium ellipticum	18	53.29	367.70	
Poeciloneuron indicum	368	1,724·70	9,060·70	
Cullenia rosayroana	2	5.60	39·30	
Artocarpus heterophyllus	11	36·54	..	
Ailanthus triphysa	5	12·75	..	
COUPE VIII				
Mesua ferrea	130	465·77	3,108·30	
Calophyllum elatum	4	10.20	79.20	
Palaquium ellipticum	18	53.29	367·70	
Poeciloneuron indicum	393	1,820.05	9,589·20	
Cullenia rosayroana	2	8.05	56·80	
Canarium strictum	2	8·10	56.30	
Vateria indica	5	23.22	168·40	
Dysoxylum malabaricum	4	17.07	..	
Artocarpus heterophyllus	13	44.03	..	
Ailanthus triphysa	8	21·10	..	
Bischofia javanica	8	26.19		
Croton oblongifolius	2	8·35	..	
Vatica chinensis	3	7·17	..	
COUPE IX				
Mesua ferrea	128	451.14	3,004·60	
Calophyllum elatum	7	17.85	138.60	
Palaquium ellipticum	4	8.80	60·80	
Poeciloneuron indicum	332	1,713 10	9,237·70	
Cullenia rosayroana	128	603.09	4,121.30	
Canarium strictum	3	9.30	65·70	
Artocarpus heterophyllus	6	14·95	..	
Cedrela toona	1	2.20	..	
COUPE X				
Mesua ferrea	127	446.74	2,967.40	
Calophyllum elatum	8	20.40	158.40	
Palaquium ellipticum	6	13.77	95.00	
Poeciloneuron indicum	338	1,740·00	9,377·60	
Cullenia rosayroana	128	662·40	4,521.30	

Species. (1)	*Number of exploitable trees* (2)	*Volume in cubic metres.* (3)	*Sleeper out-turn in B. G. units.* (4)	*Remarks.* (5)
COUPE X—*cont.*				
Canarium strictum	8	22·80	201·80	
Ailanthus triphysa	18	38·17	..	
Cedrela toona	4	9·37	..	
COUPE XI.				
Mesua ferrea	128	451.14	3,004·60	
Calophyllum elatum	8	20·40	158·40	
Palaquium ellipticum	5	11·00	76·90	
Poeciloneuron indicum	336	1,733·20	9,345·60	
Cullenia rosayroana	131	621·37	4,245·00	
Canarium strictum	5	15·75	111·20	
Ailanthus triphysa	9	21·30	..	
Cedrela toona	2	4·40	..	
COUPE XII.				
Mesua ferrea	160	574·00	3,824·20	
Calophyllum elatum	8	20.40	158·40	
Palaquium ellipticum	7	17·15	127·00	
Poeciloneuron indicum	347	1,787·45	9,640·50	
Cullenia rosayroana	143	674·94	4,610·00	
Canarium strictum	4	12·15	85·90	
Artocarpus heterophyllus	5	17·32	..	
Ailanthus triphysa	10	25·50	..	
Cedrela toona	1	2·20	..	
Bischofia javanica	8	23·67	..	
Diospyros ebenum	5	14·46	—	
Vatica chinensis	4	9·94	—	
COUPE XIII.				
Mesua ferrea	154	583·32	3,557·40	
Calophyllum elatum	7	17·85	138·60	
Palaquium ellipticum	6	14·95	102·90	
Poeciloneuron indicum	347	1,425·65	9,637·32	
Cullenia rosayroana	143	746·69	4,610·00	
Canarium strictum	4	12·15	85·90	
Artocarpus heterophyllus	6	18·04	..	
Ailanthus triphysa	10	25·50		
Cedrela toona	1	2·20		
Bischofia javanica	8	23·67	..	
Diospyros ebenum	5	14·46	..	
Vatica chinensis	4	11·16	..	
COUPE XIV.				
Mesua ferrea	15	65.83	472·30	
Calophyllum elatum	356	1,564·75	10,229·40	
Palaquium ellipticum	192	582·70	4,389·30	
Canarium strictum	34	155·80	1,073·70	
Vateria indica	109	260·69	1,811·60	
Dysoxylum malabaricum	197	641·89	..	
Bischofia javanica	5	11·00		
Vatica chinensis	17	36·80	..	
COUPE XV.				
Mesua ferrea	29	131·96	901·30	
Calophyllum elatum	260	1,209·60	7.843·20	
Palaquium ellipticum	253	823·84	5,734·10	
Cullenia rosayroana	63	294·92	2,011·80	
Vateria indica	33	97·46	673·10	
Dysoxylum malabaricum	193	701·46	..	
Artocarpus heterophyllus	31	118·60	..	
Cedrela toona	8	7·17	..	
Bischofia javanica	18	49·86	..	
Vitex altissima	51	218·57	..	
Diospyros ebenum	6	16·70	..	
Croton oblongifolius	7	17·77	..	
Vatica chinensis	5	12·85	..	

SECTION 6—METHOD OF EXECUTING FELLINGS.

604. *The annual coupe and its lay out.*—The annual coupe will be demarcated on the ground in accordance with the felling series map, by cut lines 2 metres wide, except where the boundary is well defined by natural features. The survey and demarcation will be completed by September of the year previous to felling.

605. *Agency of exploitation.*—The present method of extraction of sleepers partly departmentally and partly by contractor's agency gives the Government only a small margin of profit not even equal to the seignforage rate for the wood utilised. It is therefore prescribed that the entire work be done departmentally as in the case of the teak conversion coupes of Tunacadavu Range in order to reduce exploitation costs. The transport of sleepers from the coupe to Pollachi rail-head alone will be got done by contractor's agency. Similarly, if it is decided to extract some of the saleable non-sleeper species (excepting matchwoods) like *Dysoxylum malabaricum*, *Cedrelo toona*, *Vitex altissima*, *Diospyros ebenum*, *Artocarpus heterophyllus*, etc., as round timber they will be also felled and converted departmentally as prescribed under the Teak Plantation Working Circle, and transported to Pollachi Timber Depot through contractor's agency for sale.

606. *Porotes* and top ends left in the coupe after sleeper conversion will be sold in auction for removal by contractor's agency. Departmental conversion of porotes and top ends is not suggested as this will present difficulties in accounting.

If it is decided to sell any of the softwood species, for, e.g. *Ailanthus triphysa*, *Vateria indica*, *Canarium strictum*, etc., as timber, they will be enumerated and sold standing, since they quickly deteriorate after conversion.

608. *Marking rules.*—The following rules will regulate the marking of trees for selection felling :—

(*i*) only trees of saleable species of a girth of 2.1 metres and above will be marked.

(*iii*) No two trees within a chain distance of each other shall be marked, provided

(*iii*) No two trees within a chain distance of each other shall be marked, provided that if two trees are close enough to form only one gap, both may be marked.

(*iv*) As far as possible, the largest trees should be preferred in marking to trees of lower girth. The better tree with vigorous growth and good shape will be retained in preference to badly shaped or moribund or diseased trees.

(*v*) All dead, dying and fallen trees of saleable species irrespective of their girth will be marked for felling.

(*vi*) Trees marked for felling should be serially numbered irrespective of the species and should have the numbers chiselled on them both at stump height and breast height so that after felling, the stump as well as the tree may be identified.

(*vii*) All climbers on trees marked as well as on neighbouring trees should be cut at the time of marking so that when felling takes place, damage to neighbouring trees is minimised.

(*viii*) The marking should be done by an experienced Forester who is able to identify the evergreen species and has had sufficient experience in enumeration and estimation of length of exploitable boles.

(*ix*) The District Forest Officer or his Gazetted Assistant must check at least 10 per cent of the marking.

(*x*) The enumeration figures will be entered in the respective register and the probable out-turn arrived at with reference to the out-turn tables given in Chapter VI of Part I.

(*xi*) The marking and enumeration will be completed normally by December of the year previous to felling and the estimate of yield prepared in the following January, so that estimates can be sanctioned and enumeration checked before felling starts on 1st April.

609. *Extraction scheme.*—An extraction scheme will be drawn up for the coupe at the time of marking, showing the location of convenient drag-paths, depots and cart-tracks on a map drawn to a scale of 1 centimetre = .0528 kilometres (12 inches to a mile. The extraction plan should be approved by the District Forest Officer.

610. ***Period of working.***—The period of working will be for one year from 1st April to 31st December.

611. *Felling.*—The trees should be felled close to the ground with as little wastage as possible. As far as possible, lower branches of lofty trees should be cut before felling in order to minimise damage to other trees. The direction of fall should be on the uphill side. Special emphasis is laid on these two prescriptions as well as climber cutting all over the coupe at the time of marking, in order to minimise damage which has been very heavy in almost all the coupes worked during the last decade.

612. *Conversion.*—The felled trees will be sawn into logs at site so that they can be easily dragged by elephants to the sawing platforms. The sawing platforms will be erected at convenient sites all over the coupe. The 3 categories of Railway sleepers generally in demand are Broad Guage, Metre Guage and Narrow Guage. The dimensions of these 3 categories of sleepers are given below:—

Broad Guage—2.74 metres by 25.4 centimetres by 12.7 centimetres.

Metre Guage—1.83 metres by 20.3 centimetres by 11.5 centimetres.

Narrow Guage—1.52 metres by 17.8 centimetres by 11.4 centimetres.

613. The sleepers are generally cut at site a few inches longer than the prescribed length, so as to prevent any damage that may be undergone while in transit to the railway yard at Pollachi. The ends will be cut off at the rail-head depot just before passing.

614. The proportion in which the 3 categories of sleepers are to be manufactured will depend upon the annual requirements of the Railways and agreed to by the department.

615. *Transport.*—The sleepers will be transferred to the Railway Goods Yard at Pollachi by motor lorries through contractor's agency as in the case of timber extracted in the Tunacadavu Range. Transport in the current year's coupe must be completed before 31st March of the year of working.

616. *Passing and delivery.*—Passing of sleepers at the goods yard will be done periodically by the Forest Utilisation Officer as and when stocks accumulate. Iron sleeper clamps will be affixed on each face of all the passed sleepers in order to prevent splitting. The sleepers will then be released to the Railways.

617. Sleepers rejected by the Forest Utilisation Officer while passing will be also delivered to the Railways at rates agreed upon with the Railways from time to time. If these are not required by the Railways, they may be sold in auction to the public.

618. *Porotes and top ends.*—*Porotes* or wastages of timber and top ends of felled trees left in the coupe after conversion into sleepers have a good demand; the former for use as scantlings and the latter as fuel. These will be sold in auction after the extraction of sleepers is completed with a *voidah* of 9 months from April to December.

SECTION 7—TABULAR STATEMENT OF FELLINGS.

619. The coupes to be worked during the period of this plan, the years in which they should be exploited and the areas of the individual coupes are shown in the following statement. Details of coupes to be worked for the next 5 years are also given, in case the revision of the working plan is not taken up in time. If a coupe of a given number lies in more than one compartment, the sub-coupes are designated by suffixing letters 'a', 'b', etc., to the coupe number.

PUNACHI SELECTION FELLING SERIES.

Year of working. (1)	*Coupe number.* (2)	*Compartment in which the coupe occurs.* (3)	*Area in hectares.* (4)	*Remarks.* (5)
1965–66	I	Italiar 4, 5, 6.	43·0	
1966–67	II	Italiar 4, 5, 6, 7.	43·0	
1967–68	III	Italiar 4, 5, 6, 7.	43·5	
1968–69	IV	Italiar 4, 5, 6, 7.	44·0	
1969–70	V	Italiar 4, 5, 6, 7.	43·5	
1970–71	VI	Italiar 6, 7. Kallar 25.	43·0	

Year of working (1)	*Coupe number.* (2)	*Compartment in which the coupe occurs.* (3)	*Area in hectars.* (4)	*Remarks.* (5)
1971–72	**VII**	**Italiar 6, 7.** **Kallar 25.**	**42·5**	
1972–73	**VIII**	**Italiar 6, 7.** **Kallar 25.**	**43·5**	
1973–74	**IX**	**Italiar 7.** **Kallar 25.**	**43·6**	
1974–75	**X**	**Italiar 7.** **Kallar 25.**	**43·4**	
1975–76	**XI**	**Italiar 7.** **Kallar 25.**	**43·6**	
1976–77	**XII**	**Italiar 7.** **Kallar 22, 25.**	**43·0**	
1977–78	**XIII**	**Kallar 22, 25.**	**43·5**	
1978–79	**XIV**	**Parayankadavu 2,** **Palakadavu 104.**	**44·0**	
1979–80	**XV (a)** **XV (b)**	**Parayankadavu 1, 2.** **Perumkundru 9.**	**33·0** **23·5**	

SECTION 8—SUBSIDIARY SILVICULTURAL OPERATIONS.

620. *Tending of natural cardamom.*—Profuse regeneration of cardamom occurs in the gaps caused by felling in the worked coupes in the year following sleeper working. It is desirable to tend the natural cardamom departmentally and collect the crop. The following measures are therefore prescribed.

(i) The cardamom regeneration will be tended by removing all undergrowth and saplings of useless species interfering with the cardamom seedlings, besides removal of overhead shade in the gaps created by felling trees for sleepers;

(ii) The cardamom seedlings will be spaced out evenly 2 metres apart and necessary mulching done to the plants. The surplus seedlings may be sold to the desirous public at rates fixed by the District Forest Officer;

(iii) Some sort of bunding on the lower side of the plants will also be done on sloping terrain to prevent soil wash;

(iv) Weeding the cardamom plants will be done year after year, as and when necessary to prevent root competition and smothering of plants;

(v) Spraying the plants with insecticides like Folidol periodically may be done after the plants are three years of age to prevent pests like thrips which damage the crop sometimes heavily. The advice of cardamom planters in the Anamalai estates and the UPASI may be sought in this direction to keep abreast with the latest developments in pest control.

621. The cardamom crop will be disposed off in auction as a separate unit as detailed under the chapter on Minor Forest Produce Working Circle.

622. *Tending of natural regeneration in the felled coupe.*—In the present state of our knowledge about the silvicultural needs of evergreen species, artificial regeneration of an evergreen forest is not considered possible. Specific efforts done in the past in the way of gap regeneration to artificially regenerate these species have also not given satisfactory results. Steps for the regular artificial regeneration of these forests are therefore not necessary and none are prescribed now.

623. However, it is recognised that it is desirable to undertake measures to increase the proportion of utilisable species in the crop and favour their development. Enumeration figures taken reveal that the lower girth classes are well represented in the crop and the condition of natural and advance growth may be generally considered satisfactory. A proper tending done to create conditions suitable for the proper growth and development

of existing natural regeneration and advance growth of valuable species seems to be extremely desirable and is therefore prescribed. The following measures are therefore prescribed to be done in the year following felling :—

(i) Cutting down or girdling of useless species in the second storey interfering or smothering advance growth of useful species.

(ii) Climber cutting.

(iii) Thinning out congested patches of regeneration. This is particularly necessary in the Italiar valley were *Poeciloneuron indicum* comes up gregariously in swampy patches.

SECTION 9—OTHER REGULATIONS.

624. *Closure to grazing.*—All the areas included in this working circle be closed to grazing.

625. ***Planting of coupe stones.***—The coupe number and year of working of each coupe will be indicated on stone slabs planted in salient corners of the coupe.

626. ***Fire protection.***—No special fire protection measures are considered necessary.

SECTION 10—CONTROL.

627. A control book, record of works, control map and control journal will be maintained for this working circle. The manner in which these records are to be maintained is detailed in section 22 under the chapter on Miscellaneous Regulations.

CHAPTER IV—WORKING PLAN FOR THE FUEL WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

628. *Objects of management.*—The main object of this circle is to ensure the sustained production of the maximum quantity of fuel which the forests included are capable of yielding and for which there is an assured demand in the adjoining villages and towns, and to some extent small timber for local use.

629. *General constitution.*—This working circle will include the lower slopes of the hills in the Pollachi and Udumalpet Ranges that can be exploited for fuel at a profit. It will include the areas included in the past plan, but with the following changes which considerably diminish the total area of the working circle :—

(i) Excluding all areas submerged or deforested on account of the Amaravathi and Aliyar reservoirs;

(ii) Excluding all areas that have been already deforested for construction of camp sites, roads, etc., of the Parambikulam-Aliyar Project and the Electricity Board;

(iii) Excluding most of the areas below the Parambikulam-Aliyar Project Contour Canal in the Thirumurthi Block (Compartments 2 to 6), as these areas have been virtually deforested by blasted rock and debris;

(iv) Excepting in the Nallar Block, all areas above the Parambikulam-Aliyar Project Contour Canal in the Pollachi Range have been excluded, as transport of produce from these areas will be difficult owing to inaccessibility;

(v) Excluding portions of the old Nallar and Dhali series in the Udumalpet Range which now contain little exploitable growth, owing to inadequate regeneration following ‘ simple coppice ’ fellings. Such areas occur in Thirumurthi 10 and 11, and Jallipatti 2, 5 and 6

(vi) Compact areas regenerated with *Eucalyptus* hybrid either pure or in mixture with other species in the Pollachi Range during the past plan and such areas considered suitable for raising wth this species are deleted from this working circle in order to constitute a separate *Eucalyptus* Hybrid Working Circle;

(vii) Areas lying below the Sethumadai Canal and the Aliyar Feeder Canal in the Pollachi Range and can be subjected to irrigation by water flowing in these canals are excluded in order to constitute a separate Irrigated Teak Plantation Working Circle. The areas thus excluded are Sethumadai 12 and portions of Sethumadai 8, 11 and Uppar 1 and 2.

630. In addition to the above, some areas which were not considered suitable for working in the past on account of lack of extraction facilities are now included in the working circle. Such areas include portions of Nallar 5 to 10 in the Udumalpet Range and Thulukkamadai 1 and 4 in the Pollachi Range.

631. *Area.*—The total area of this working circle is 6,282 hectares.

632. *Character of the vegetation.*—The character of the vegetation varies considerably between the eastern and western portions of the working circle due to variation in the amount of precipitation received. In the Sethumadai and Upper Blocks of Pollachi Range which benefit from both the monsoons, the forest is generally 'dry deciduous' which disintegrates gradually into a 'Southern Cutch thorn type' as one proceeds eastwards, since the rainfall from the south-west monsoon becomes progressively less. The chief useful species in the dry deciduous zone are *Pterocarpus marsupium*, *Grewia tiliaefolia*, *Terminalia paniculata*, *Terminalia tomentosa*, *Albizzia odoratissima*, *Anogeissus latifolia* and some teak and rosewood. These generally grow to a height of 12 metres or more. Both the bamboos, *Bamboos, arundinacca* and *Dendrocalamus strictus* occur, but *Dendrocalamus* is decidedly more abundant. In the southern cutch thorn type, the trees rarely attain a height of 7 metres, with thorny species and the more hardy useless softwoods generally preponderating. *Acacia leucophloea*, *Acacia ferruginea*, *Albizzia amara*, *Azadirachta indica*, *Tamarindus indica*, *Protium caudatum*, *Wrightia tinctoria*, *Gyrocarpus jacquini* and *Acacia ferruginea* are the common species. A detailed description of both the types are given in Chapter II of Part I.

633. *Plantations.*—In addition to the natural forest types mentioned above, the working circle also includes several plantations raised in the past by the *kumri* method particularly over large areas in the Pollachi Range. These include from plantations of thorny species such as *Acacia arabica* and *Prosopis julieflora* raised during the early years of the last decade, to plantations of miscellaneous fuel species such as Tamarind, Neem, *Albizzia odorotissima*, all mixed in varying proportions. Even plantations of regular timber species such as Teak, *Terminalia tomentosa*, *Dalbergia latifolia* and *Dalbergia sissoo* have also been raised often in association with purely fuel species such as Neem and Tamarind.

SECTION 2 —BLOCKS AND COMPARTMENTS.

634. The compartments in which this working circle is constituted are given in paragraph 635. The details of the areas included under this working circle in each of these compartments are given in Appendix I and shown on the concerned management maps.

SECTION 3 —DIVISION OF THE AREA.

635. *Division into felling series.*—Due to modifications in the total extent and location of the areas included in the past plan for the reasons mentioned in paragraphs 629 and 630, the areas left over to form this working circle had to be reconstituted to form 8 felling series. Three of the felling series lie in Pollachi Range and five in Udumalpet

Range. The Nallar Series will be confined only to Pollachi Range as portions of this series falling in Udumalpet Range are now devoid of growth. The distribution of the felling series under each range with other particulars are given below :

Serial number. (1)	*Name of felling series.* (2)	*Area in hectares.* (3)	*Compartments in which the series occurs.* (4)
	POLLACHI RANGE.		
1.	Sethumadai	412·0	Uppar 1 to 3. Sethumadai 2 to 5, 7 to 9.
2.	Kottur	697·0	Thulukkamadai 1, 3 to 8. Uppar 5 to 8. Vannanthorai 2, 5, 6, 8 and 9.
3.	Nallar	540·0	Nallar 3 to 11.
	UDUMALPET RANGE.		
4.	Dhali	998·5	Elumalaiyankoil 4 to 8 Jallipatti 1 to 4, 6. Thirumurthi 1, 2, 6 to 12.
5.	Kamanuthu	995·5	Elumalaiyankoil 2 to 6. Punganodai 1, 3, 4, 6 to 10.
6.	Chinnar	1,304·0	Chinnar 1 to 6. Punganodai 8. Kodanthur 13.
7.	Amaravathi	917·0	Amaravathi 5, 9 to 14.
8.	Navalodai	418·0	Amaravathi 14 to 16.

SECTION 4—ANALYSIS AND VALUATION OF THE CROP

636. *Stockmapping.*—All the fuel series have been stockmapped ocularly so as to determine the probable out-turn of firewood in tonnes per hectare. Only such areas as are capable of yielding at least 5 tonnes of fuel per hectare on exploitation are included in this working circle. The stockmaps thus prepared have been appended to this plan.

637. *Valuation of the crop.*—No detailed enumeration or valuation of the crop was done, as this was not considered necessary.

SECTION 5.—METHOD OF TREATMENT.

638. *Silvicultural system.*—The silvicultural system will be in general the 'coppice with reserves' system, but in coupes or portions of coupes suitable for planting, regeneration from coppice will not be relied upon and the area will be artificially regenerated under the aegis of *kumri*. Coppice regeneration has never been satisfactory in the past and hence the necessity to resort to artificial restocking wherever the soil conditions are conducive for such work. All growth within the annual coupe whether saleable or unsaleable will be cut excepting certain species, viz. *Tamarindus indica*, *Terminalia chebula*, *Sapindus emarginatus*, *Feronia limonia*, *Aegle marmelos*, *Madhuca indica* and *Pongamia pinnata* which will be treated as 'reserved species' and shall not be felled (unless they have ceased to bear), in accordance with the present policy of the Government. The retention of these species is prescribed because they are not regular fuel yielding species and their value as minor forest produce trees is much greater than their fuel value. Neem which is also treated as a reserved species in most divisions is not prescribed as one, as the small demand for its seeds is easily met from trees on road-side avenues or in the country-side. As far as the writer is aware, practically no collection of neem seeds is made from the forests of the division.

639. *Choice of species.*—In the Pollachi Range where the conditions are moister, more valuable species such as Teak, *Terminalia tomentosa*, *Pterocarpus marsupium*, *Albizzia odoratissima*, *Albizzia lebbek*, *Tamarindus indica* and *Dalbergia sissoo* will be raised with a view to obtain some small timber also. In the Udumalpet Range, where conditions are decidedly drier, hardier fuel species such as Tamarind, Neem and *Albizzia lebbek* will be planted. Teak, *Terminalia tomentosa*, *Pterocarpus marsupium*, *Albizzia odoratissima* and *Dalbergia sissoo* will not be tried in the Udumalpet Range as they are not likely to succeed.

640. *Rotation.*—The rotation for any fuel forest should be theoretically fixed at the age of maximum volume production. Since accurate data to calculate the age at which the mean annual increment culminates is not available, the rotation will have to be therefore empirically fixed. The rotation will be fixed at 30 years. This is generally the rotation fixed for fuel forests in the state.

641. *Regulation of the yield.*—The yield will be regulated by area. In each felling series therefore, the size of the annual coupe is obtained by dividing the total area by the period of the rotation.

SECTION 6—METHOD OF EXECUTING FELLINGS.

642. *The annual coupe and its lay out.*—The annual coupe will be demarcated on the ground in accordance with the felling series map by cut lines 2 metres wide except where the boundary is already well defined by natural features. The correct area of the coupe will be computed on the basis of actual survey which must be done by an officer not below the rank of a Forester, but should be countersigned by the Range Officer who will certify to the correctness of the survey after checking. Any small difference between the actual area of the coupe and the area as shown in the tabular statement of fellings will not involve a deviation requiring sanction so long as the difference does not exceed 5 per cent.

643. While carrying out the survey and demarcation of the fuel coupe, trees on the outer periphery of the forest in the adjoining portions not to be felled should be ring-marked and serially numbered at breast height with red paint. A list showing the number, species, girth at breast height (over bark), and location (whether north, south, east or western boundary) will form part of the lease agreement. This will prevent to a great extent any clandestine extension of coupe limits by contractors.

644. 'Reserved species' such as Tamarind, *Terminalia chebula, Sapindus emarginatus, Feronia limonia, Aegle marmelos, Madhuca indica* and *Pongamia pinnata* occurring in the coupes will be marked and numbered with breast height and a list showing the number of the trees, species and girth will also form part of the lease agreement.

645. *Division into strips.*—Each coupe will be divided into strips. Coupes below 20 hectares in extent will be divided into two strips, while coupes above 20 hectares in extent will be divided into three strips. The strip lines will be cut by lines 1 metre wide.

646. The cut materials obtained while clearing the coupe and strip lines will belong to the contractor who takes the coupe.

647. The sequence in which the strips are to be worked will be left to the discretion of the District Forest Officer.

648. All annual coupe surveys shall be computed by the Range Officer and the field book submitted to the District Forest Officer one year prior to felling as the coupes will have to be kept open for the free removal of manure leaves by the ryots. The District Forest Officer and his Assistant between them should check the coupe surveys and enumeration lists of 'reserved species' and border trees of at least 3 coupes in each range before the coupes are put up for sale.

649. *Manure leaf removal.*—As per instructions in G.O. Ms. No. 2928, Development, dated 27th July, 1950, the ryots will be permitted to remove free of cost, manure leaves of non-reserved species in all fuel coupes one year prior to their felling. Only branches less than 7½ centimetres in girth shall be cut. Under no circumstances shall branches of 'reserved trees' be permitted to be lopped for manure leaves.

650. *Agency of exploitation.*—The coupes will be worked through the agency of contractors as the system has been established and found to be satisfactory.

651. *Period of lease.*—The coupes will be put up for sale in January or early in February so as to provide time for resale by auction or by tender if the prices obtained at the first sale are not satisfactory. The coupe will be conveyed to the lessee on the 1st of April with a voidah of 6 months for coupes below 10 hectares in extent, and 9 months for coupes with an extent of 10 to 20 hectares and one year for coupes with an area of more than 20 hectares. Irrespective of the date of sale or delay in conveying the coupe to the lessee, no extension of *voidah* should be ordinarily granted. Range Officers should ensure by frequent inspection that not only the work is carried out as per conditions of sale but also that the progress of work is sufficient to complete the removals by the end of the period of contract.

652. *Coupe arrears.*—In the event of any coupe remaining unsold or portions of coupe remaining unfelled within the lease period in any particular year, such portions will be sold in the subsequent year with such *voidah* as the District Forest Officer deems necessary, unless he is satisfied that the area is not economically exploitable. In the latter event, the District Forest Officer will record the facts in the control journal and make suitable entries on the control map.

653. *Felling and extraction rules.*—(i) The coupe should be felled in a systematic manner, strip by strip. A new strip may be entered into only after the Range Officer has personally satisfied himself that the work in the previous one has been satisfactorily completed.

(ii) All 'reserved trees' mentioned in paragraph 638 shall not be felled by the contractor, except such old or unsound trees as have been expressly authorised to be felled by the District Forest Officer. Smaller saplings and seedlings of 'reserved species' although may not permit of marking and numbering, will also not be felled by the contractor.

(iii) Excepting for the 'reserved species' mentioned above, the contractor will clearfell all shrubs, trees and climbers even if the species is not required by him, or otherwise the proportion of unwanted species like *Euphorbia antiquorum*, *Gyrocarpus jacquini*, *Givotia rottleriformis*, *Protium caulatum*, *Comntphora berryi* and *Moringa oleifera* will increase to the detriment of the more valuable species. If the contractor fails to comply with this provision, the trees left standing will be clearfelled by the department and the cost thereof recovered from the contractor. A condition to this effect will be introduced in the sale agreement.

(iv) No tree growth within one chain on either side of perennial or semi-perennial stream or streams within or along the boundaries of the coupe will be felled. Such streams if any will be clearly marked on the surveyed sketch of each coupe attached to the sale list. The area of one chain on each side thus marked will however not be excluded from the total area of the coupe.

(v) Everything the contractor cuts shall be cut clearly with sharp axes or bill hooks as close to the ground as possible in any case within 15 centimetres from the ground level, in such a manner that the bark is not separated from the wood. No trimming of the stools is necessary. In areas where *kumri* regeneration is possible, such a condition need not be insisted and the contractor allowed to uproot the stumps even, if he so desires. Such areas should be clearly demarcated on the coupe sketch.

(vi) Sawing will be prohibited, except for felling trees or for billeting them into transportable sizes.

(vii) Bamboos found inside the fuel coupe will be the property of the fuel coupe contractor; they may be clearfelled by him.

(viii) The contractor will stack all cut firewood into stacks of such size as may be prescribed by the District Forest Officer prior to removal.

(ix) Timber or poles extracted from any coupe will be hammer-marked by the Beat Guard at stump site before removal.

(x) The contractor may construct at any time cart-tracks in any part of the coupe irrespective of the strip he may be working in. He will make only the maximum number of earth slides that are absolutely necessary for the extraction of firewood from the upper slopes.

654. *Supply of agricultural implements.*—The contractor shall at all times during the period of his contract sell to ryots on demand for their bonafide domestic and agricultural purposes all kinds of produce in the coupe at rates to be fixed by the District Forest Officer in consultation with the Collector.

655. The contractor shall also be bound to supply to the members of the Jaggery Co-operative Societies on demad brushwood such as thorns and twigs of 15 centimetres and below in girth at such rates as may be fixed by the District Forest Officer in consultation with the Collector.

SECTION 7—TABULAR STATEMENT OF FELLINGS.

656. The following statements show the coupes to be worked annually during the next ten years in each of the felling series included in the Fuel Working Circle. The coupes to be worked in the succeeding five years in case the revision of the plan is not undertaken in time are also indicated below. If a coupe of a year lies in two or more different bits, the sub-coupes are designated by suffixing letters 'a', 'b', 'c', etc., to the coupe number :—

Year of felling. (1)	*Coupe number.* (2)	*Compartments in which the coupe occurs.* (3)	*Area in hectares.* (4)
		(a) SETHUMADAI FUEL FELLING SERIES.	
1965–66	I	Uppar 3	14.0
1966–67	II	Uppar 2, 3	14·0
1967–68	III	Uppar 2	13·5
1968–69	IV	Uppar 2	14·0
1969–70	V	Uppar 1, 2	14·0
1970–71	VI	Uppar 1	13·5
1971–72	VII	Uppar 1	13·0
1972–73	VIII	Uppar 1	14·0
1973–74	IX	Sethumadai 3, 4	13·5
1974–75	X	Sethumadai 4	13·5
1975–76	XI	Sethumadai 4	13.5
1976–77	XII	Sethumadai 4, 5	13·5
1977–78	XIII	Sethumadai 5	13·5
1978–79	XIV	Sethumadai 5	13·5
1979–80	XV	Sethumadai 5	13·5
		(b) KOTTUR FUEL FELLING SERIES.	
1965–66	I	Thulukkamadai 7, 8	23·0
1966–67	II	Thulukkamadai 7, 8	23·5
1967–68	III	Thulukkamadai 5, 7	24·0
1968–69	IV	Thulukkamadai 3, 5	23·5
1969–70	V	Thulukkamadai 5, 7	23·5
1970–71	VI	Thulukkamadai 5, 7	23·5
1971–72	VII	Thulukkamadai 5, 7	23·5
1972–73	VIII	Thulukkamadai 5, 7	23·5
1973–74	IX	Thulukkamadai 3, 5	23·5
1974–75	X	Thulukkamadai 3, 5	23·5
1975–76	XI	Thulukkamadai 1, 4	23·5
1976–77	XII(*a*)	Thulukkamadai 1	9·0
	XII(*b*)	Thulukkamadai 1	14·0
1977–78	XIII	Uppar 5, 6	21·5
1978–79	XIV(*a*)	Uppar 6, ...	13·0
	XIV(*b*)	Uppar 6, 7	10·0
1979–80	XV	Uppar 6, 7, 8	22·0
		(c) NALLAR FUEL FELLING SERIES.	
1965–66	I	Nallar 8, 11	18·0
1966–67	II	Nallar 4, 5, 8	18·0
1967–68	III	Nallar 4	18·0
1968–69	IV	Nallar 4, 5	18·0
1969–70	V	Nallar 5, 6, 7, 8	18·0
1970–71	VI	Nallar 7, 8	18·0

Year of felling.	Coupe number.	Compartments in which the coupe occurs.	Area in hectare.
(1)	(2)	(3)	(4)
(c) NALLAR FUEL FELLING SERIES—cont.			
1971–72	VII	Nallar 8	18·0
1972–73	VIII	Nallar 7, 8	18·0
1973–74	IX	Nallar 7, 8	18·0
1974–75	X	Nallar 8	18·0
1975–76	XI	Nallar 8, 9, 10	18·0
1976–77	XII	Nallar 8, 10, 11	18·0
1977–78	XIII	Nallar 3, 4	18·0
1978–79	XIV	Nallar 3	18·0
1979–80	XV	Nallar 3	18·0
(d) DHALI FUEL FELLING SERIES.			
1965–66	I	Elumalayankoil 8 and Jalipatti 6	33·5
1966–67	II	Elumalayankoil 8 and Jallipatti 6	32·5
1967–68	III	Elumalayankoil 4	31·5
1968–69	IV	Elumalayankoil 4	32·0
1969–70	V	Elumalayankoil 4, 5	31·5
1970–71	VI	Thirumurthi 6	35·0
1971–72	VII	Thirumurthi 6, 7, 8	35·0
1972–73	VIII	Thirumurthi 8, 9	35·0
1973–74	IX	Thirumurthi 11, 12	35·0
1974–75	X	Thirumurthi 11	32·5
1975–76	XI	Thirumurthi 11	32·
1976–77	XII	Thirumurthi 11	33·0
1977–78	XIII	Jallipatti 3	33·5
1978–79	XIV	Jallipatti 3, 4	33·0
1979–80	XV(*a*)	Jallipatti 4	19·5
	XV(*b*)	Jallipatti 2	12·5
(e) KAMANUTHU FUEL FELLING SERIES.			
1965–66	I	Elumalayankoil 3	33·5
1966–67	II	Elumalayankoil 3	33·0
1967–68	III	Elumalayankoil 2, 3	33·0
1968–69	IV	Punganodai 8	33·0
1969–70	V	Punganodai 8, 9	32·5
1970–71	VI	Punganodai 8, 9	33·0
1971–72	VII	Punganodai 9	33·0
1972–73	VIII	Punganodai 8, 9	33·5
1973–74	IX	Punganodai 9, 10	33·0
1974–75	X	Punganodai 9, 10	33·0
1975–76	XI	Punganodai 10	33·0
1976–77	XII	Punganodai 8, 9, 10	33·0
1977–78	XIII	Punganodai 8, 9	33·0
1978–79	XIV	Punganodai 1, 8	33·0
1979–80	XV	Punganodai 1, 3	33·0
(*f*) CHINNAR FUEL FELLING SERIES.			
1965–66	I	Chinnar 3	43·5
1966–67	II	Chinnar 3	43·0
1967–68	III	Chinnar 2, 3	43·0
1968–69	IV	Chinnar 1, 2	43·5
1969–70	V	Chinnar 1	43·5
1970–71	VI	Chinnar 1 and Kodanthur 13	43·5
1971–72	VII	Chinnar 1 and Kodanthur 13	43·5
1972–73	VIII	Chinnar 1	43·5
1973–74	IX	Chinnar 1, 2	44·0
1974–75	X	Chinnar 2	43·5
1975–76	XI	Chinnar 1, 2	43·0
1976–77	XII	Chinnar 2, 3	44·0
1977–78	XIII	Chinnar 2, 3	44·0
1978–79	XIV	Punganodai 8, Chinnar 2, 3	43·5
1979–80	XV	Chinnar 3	43·0
(*g*) AMARAVATHI FUEL FELLING SERIES.			
1965–66	I	Amaravathi 11, 12	31·0
1966–67	II	Amaravathi 11	31·0
1967–68	III	Amaravathi 12	31·0
1968–69	IV	Amaravathi 12	30·0
1969–70	V	Amaravathi 10, 12	30·5
1970–71	VI	Amaravathi 10	31·0
1971–72	VII	Amaravathi 9, 10	30·5
1972–73	VIII	Amaravathi 9, 10	30·5
1973–74	IX	Amaravathi 9, 10	30·5

Year of felling. (1)	*Coupe number.* (2)	*Compartments in which the coupe occurs.* (3)	*Area in hectors.* (4)
(*g*) AMARAVATHI FUEL FELLING SERIES—*cont.*			
1974-75	X	Amaravathi 9	30·5
1975-76	XI	Amaravathi 9, 10	30·5
1976-77	XII	Amaravathi 5, 9, 10	30·5
1977-78	XIII	Amaravathi 5, 10	31·0
1978-79	XIV	Amaravathi 5, 11	30.5
1979-80	XV	Amaravathi 12, 13	30·5
(*h*) NAVALODAI FUEL FELLING SERIES.			
1965-66	I	Amaravathi 16	14·0
1966-67	II	Amaravathi 16	14·0
1967-68	III	Amaravathi 16	14·0
1968-69	IV	Amaravathi 16	14·0
1969-70	V	Amaravathi 16	14·0
1970-71	VI	Amaravathi 16	14·0
1971-72	VII	Amaravathi 16	14·0
1972-73	VIII	Amaravathi 16	13·5
1973-74	IX	Amaravathi 16	14·0
1974-75	X	Amaravathi 15, 16	14·0
1975-76	XI	Amaravathi 15, 16	14·0
1976-77	XII	Amaravathi 15, 16	14·0
1977-78	XIII	Amaravathi 15	14·0
1978-79	XIV	Amaravathi 14	14·0
1979-80	XV	Amaravathi 15, 16	13·5

657. The annual areas to be clearfelled in each series have been marked on the management maps prepared and appended to this plan.

SECTION 8—REGULATION OF REGENERATION OPERATIONS.

658. *Method of regeneration.*—The *kumri* method of regeneration has the outstanding advantage of ensuring that the crop gets the continued protection and attention it requires in the first two years. Incidentally it tends to meet to some extent the prevalent land hunger and results in growing more food. The *kumri* system of regeneration has been tried with great success in the Pollachi Range and excellent fuel *kumries* have been raised in this range from 1939–40 onwards. Even in the Udumalpet Range where conditions are comparatively drier, there has been a demand for *kumri* cultivation during the past few years. Even if *kumridars* are not available, steps should be taken to regenerate the maximum area possible in each coupe departmentally.

659. The present practice in the Pollachi Range is to sell the fuel coupes in the range with the right to do *kumri* cultivation for a period of 3 years after the year of felling. This method has been successful in practice and may be continued in future, but if it is felt that better revenue could be derived if the right to clearfell and the right to *kumri* is put up for auction separately as is the practice elsewhere in the state, the latter practice may be adopted. In the Udumalpet Range, where the *kumri* system was introduced recently, the right to do *kumri* is given free, subject to the condition that the *kumridar* supplies on demand, labour to the department for the regeneration operations and the subsequent weedings. This practice may be discontinued as soon as there is competitive demand for taking up *kumri* cultivation in auction. In several fuel series in Udumalpet Range, *kumries* have brought prosperity to successive *kumridars* as luxuriant cotton crops were produced and it should be possible to offer the right in auction sale.

660. As large a part of each coupe as suitable for *kumri* regeneration should be taken up for such regeneration. The District Forest Officer will decide the extent to be taken up with reference to local conditions and season. The area to be leased out should be surveyed before hand and a sketch should be attached to the agreement entered into between the *kumridar* and the District Forest Officer. In coupes where the right to

do *kumri* cultivation is sold separately, the area should be handed over to the *kumridar* in sufficient time to be fixed before hand to enable him to cut and burn the growth left in the area and prepare the soil before the sowing season.

661. *Preparation of the planting site—(a) Burning.*—The *kumridars* shall cut any standing growth including regrowth except the reserved trees and pile them in convenient heaps together with the felling slash left behind but not too near the reserved trees to cause them injury when burning. The slash will then be burnt, care being taken to prevent the fire from escaping into the neighbouring forest. The work will be completed by the end of April in the Pollachi Range and by the end of August in the Udumalpet Range. All these operations will be done under supervision.

(*b*) *Ploughing.*—The *kumridar* shall then plough or otherwise prepare the soil over the whole area for the purpose of growing field crops. Where no ploughing is possible, hoes or other digging implements may be used for cultivation of the soil.

(*c*) *Aligning and staking.*—The following espacement will be adopted. Lines will be taken five metres apart from centre to centre. On each line, continuous mounds 6 metres wide and 3 metres high will be formed. The strips will be in straight lines, running along contours on slopes. Sowing will be done along the centre of the mounds. In the Udumalpet Range, where conditions are drier, the mounds will be also staked at intervals of 3 metres so that container plants may be also put. The formation of mounds and staking will immediately follow ploughing and should be completed at once.

662. In areas of Udumalpet Range where there is no demand for *kumri*, no burning need be done as this will increase the aridity. In the absence of *kumridars*, ploughing is out of question. Mounds will therefore not be formed. The area will be aligned and staked at an espacement of 2 metres by 2 metres for introduction of container plants and pits of 30 centimetres cube will be dug at each stake. No sowing is advocated. In such areas, the existing coppice regrowth and natural seedling regeneration will not be disturbed.

663. *Sowing and planting.*—In the Pollachi Range, planting is done during the south-west monsoon showers during May–June. In the Udumalpet Range, the south-west monsoon is scanty or very unreliable. Planting is therefore done during the north-east monsoon only during September–October. In the Pollachi Range, soon after the south-west monsoon showers are received, seeds of *Terminalia tomentosa*, *Pterocarpus marsupium*, *Albizzia lebbek*, *Tamarindus indica* and *Dalbergia sissoo* will be mixed and sown along furrows in the centre of the mounds formed. The sowing will not be supplemented by container plants, but teak stumps will be planted at intervals of 1 metre along the lines.

664. In the Udumalpet Range, hardier species such as Tamarind, Neem and *Albizzia lebbek* will be sown along the mounds on receipt of the first north-east monsoon showers. This will be supplemented by planting of container plants of the same species at an espacement of three metres along the mounds.

665. In areas of Udumalpet Range, where there is no demand for *kumri*, no sowings will be done. Only container plants will be put. Here too, the choice of species will be the same as described above. The containers will be ripped at the bottom and on one side completely by a sharp blade and lowered into the pits. As the pit is filled with earth, the container will be carefully removed without breaking the ball of earth.

SECTION 9—NURSERY.

666. *Seed collection and storage.*—The following table indicates the time for seed collection for the species recommended for planting.

Serial number and name of species. (1)	*Time for collection of seed.* (2)
1. Teotona grandis	December—February.
2. Terminalia tomentosa	November—January.
3. Pterocarpus marsupium	January—March.
4. Albizzia lebbek	March—June.
5. Albizzia odoratissima	September—December.
6. Tamarindus indica	February—April.
7. Dalbergia sissoo	March—April.
8. Azadirachta indica	June—April.

667. The seed should be collected locally from sound and well grown trees. Seeds of *Dalbergia sissoo* can be collected from the plantations around Sethumadai. Seeds of Neem are not viable if stored for a long time owing to the only nature of the seeds. Seeds of the remaining species retain their viability for a year if stored properly. They should be separated from the pericarp, dried and stored in gunny bags and used the same year.

668. *Preparation of container plants of Neem, Tamarind and Albizzia lebbek.*—container plants of Neem, Tamarind and *Albizzia lebbek* and required for planting in the Udumalpet Range. The method of preparing contained plants of Neem, Tamarind and *Albizzia lebbek* are described below :—

669. The present practice of using Polythene containers in the division will be continued. The existing practice in the division is to use short (20 centimetres long) and wide brimmed (12-1/2 centimetres wide) containers. These are not found to be quite satisfactory. The containers should be of 150 guage, 25 centimteres in reight and 10 centimetres in diameter. The containers will be filled with good clayey loam and 1 or 2 seeds of Neem, Tamarind and *Albizzia lebbek* will be shown in each container in June–July when seeds of all the three species will be available. Special emphasis is laid in keeping the consistency of the earth a little clayey, in order to prevent the clods from crumbling when the containers are removed while planting. Application of farm yard manure will help to aid this.

670. The containers will be watered regularly and kept under shade. The seeds germinate quickly. Watering will be continued, but more sparingly. The plants when they reach 8 to 10 centimetres in length, will be kept in the open in order to acclimatise them to field conditions and prevent them from growing thin and tall. If there is more than one seedling in each container, it will be clipped off. The container plants will be kept weeded regularly. The plants will be about 45 centimetres high and about 15 months old at the time of planting.

671. Teak nursery will be raised in the manner prescribed in the Teak Plantation Working Circle.

SECTION 10—SUBSIDIARY SILVICULTURAL OPERATIONS.

672. *Replacement of casualties.*—During the first year, casualties will be replaced as and when they occur, so that adequate regeneration will result by the end of the year. Gaps in the lines will be sown afresh with seeds. Similarly, container plants will be put at stakes where the original planting has failed.

673. Casualties of the first year will be also replaced during the second year.

674. *Tending.*—In areas where field crops are grown, the *kumridars* will be insisted upon to keep the lines well weeded during their tenure of two years. The soil working done to the agricultural crop will be beneficial to the forest crop. No special prescriptions are therefore made for soil working.

675. In areas where *kumri* cultivation is not done, three weedings combined with soil working are prescribed during the first year. The first weeding will be done in November combined with a soil working to a depth of 10 to 15 centimetres and a width of 2 centimetres away from the plants. The second weeding and soil working will be

done in December, and the third in January. During the second year, two weedings combined with soil working will be done first in October soon after the north-east moonsoon sets in and the second in December-January. Ordinarily, no tending operations are prescribed for the third year. If in any case the plantation remains not properly stocked due to unforeseen reasons, the District Forest Officer will prescribe such operations as he deems it necessary after obtaining the prior orders of the Conservator of Forests.

676. *Thinnings.*—A stick thinning during the fifth year is advocated in all areas where line sowing has been done. The thinnings will consist of a mechanical reduction of the number of stems resulting in the espacement equal to one-third of the height of the trees. The reduction will be also selective in the sense that preference will be given for the retention of more valuable species such as Teak, *Terminalia tomentosa*, *Dalbergia sissoo* and Tamarind in the Pollachi Range and Tamarind in the Udumalpet Range over the others.

677. No further thinnings appear necessary. If required this may be decided by the District Forest Officer in consultation with the Conservator of Forests.

SECTION 11—OTHER REGULATIONS.

678. *Demacration.*—The coupes will be demarcated with stones at the four salient corners, engraved with the number of the coupe and the year of felling, as well as the adjacent coupe number and its year of working.

679. *Plantation boards.*—The area regenerated in each year's coupe will be indicated by a small wooden board of uniform size fixed at salient points. The board should indicate in English and in Tamil, the year of formation and the actual area planted. Such of the boards that require renovation or replacement will be attended to in the month of April every year.

680. *Fencing.*—The areas regenerated will be fenced by means of a thorn fence all round.

681. *Closure to grazing.*—All felled fuel coupes will be closed to grazing for a period of five years, including the year of felling.

682. *Fire protection.*—Situated as the fuel series are mostly along the lower slopes of the decidous forests, they are subjected to periodic fires during the dry season. Plantation boundaries and inspection paths will be cleared annually to prevent the entry of any chance fires. Any fires that occur must be immediately extinguished by the local staff. Areas burnt should be closed to grazing by a prompt notification in order to allow the area to recover. The procedure to be adopted under such circumstances is detailed under the chapter on Miscellaneous Regulations.

SECTION 12—CONTROL.

683. The following control records will be maintaintd by the District Forest Officer and posted annually :—

(1) Control book.

(2) Record of works.

(3) Register of deviations.

(4) Control journal.

(5) Control maps.

(6) Plantation and nursery journals.

684. The manner in which these records are to be maintained is indicated in sections 22 and 23 under the chapter on Miscellaneous Regulations.

CHAPTER V—WORKING PLAN FOR THE EUCALYPTUS HYBRID WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

685. *Objects of management.*—The object of this working circle is to ensure the sustained production of the maximum quantity of wood by gradual replacement of the existing slow grown fuel forests of Pollachi Range by pure plantations of the quick growing *Eucalyptus* hybrid (Chickballapur variety) in areas wherever suitable and in the scientific management of the existing plantations of *Eucalyptus* hybrid.

686. *General constitution.*—The working circle will include the deciduous lower slopes of the hills of Pollachi Range that can be converted into pure plantations of *Eucalyptus* hybrid. Compact areas raised with Eucalyptus hybrid either pure or mixed with other fuel and hardwood species in the Pollachi Range during the period of the past plan are also included in this working circle. Fuel forests of Udumalpet Range are not included in this working circle, since the soil and rainfall conditions are generally not conducive for *Eucalyptus* hybrid, as can be judged from past experience.

687. *Area.*—The area of this working circle is 834 hectares. Of this, an area of 263 hectares constitutes existing plantations of *Eucalyptus* hybrid.

688. *Character of the vegetation.* The natural forests included in this working circle are essentially 'dry decidous', but there is a steady retrogression to a 'cutch thorn type' as one proceeds eastwards due to reduction in the amount of precipitation received. In the dry deciduous zone, the chief tree species are *Grewia tiliacfolia*, *Pterocarpus marsupium*, *Terminalia tomentosa*, *Terminalia paniculata*, *Albizzia ordoratissima* and *Anogeissus latifolia* with a sprinkling of Teak and Rosewood. Bampoos (*Dendrocalamus Strictus* mostly) may occur frequently, although *Bambusa arundinacea* may also be present in moister locations. Weed growth of thorny climbers is heavy with dense *Lantana*. In the 'cutch thorn type', thorny species and useless softwoods generally predominate. *Albizzia amara*, *Acacia leucophloea*, *Azadirachta indica*, *Tamarindus indica*, *Protium caudatum*, *Wrightia tinctoria*, *Gyrocarpus jacguini* and *Acacia feruginea* are the chief tree species. *Lantital* is absent, but *Acalypha fruticosa* and grasses from the undergrowth A detailed description of both the types is given in Chapter II of Part I.

689. In addition to the natural forests included, the working circle also includes plantations of *Eucalyptus* hybrid either planted pure or mixed with miscellaneous fuel and hardwood species, such as Neem, Tamarind, *Tectona grandis*, *Terminalia tomentosa*, *Dalbergia sissoo*, *Dalbergia latifolia*, etc. In the case of the mixed plantations, *Eucalyptus* hybrid planted in it has generally outgrown the other species although the latter are also present forming a fair proportion of the crop.

SECTION 2—BLOCKS AND COMPARTMENTS.

690. The compartments in which this working circle is constituted are given in paragraph 691. The details of the areas included under this working circle in each of these compartments are given in Appendix I and shown on the concerned management maps.

SECTION 3—DIVISION OF THE AREA.

691. *Division into felling series.*—The area covered by the working circle has been divided into 3 felling series, with a view to distribute the centres of working and reduce the unit of felling, the 'coupe' to a manageable extent and thereby stimulate competition among prospective bidders. The division into series will also help in distributing the regeneration centres to three different beats. The following statement shows the constitution of the felling series :—

Serial number and name of the felling series.	Area in hectares.	Compartment in which the series occurs.
(1)	(2)	(3)
1. Pothamadai	259·5	Sethumadai 1 to 3.
2. Gudaravalli	286·5	Sethumadai 4 to 6.
3. Ayerangal	288·0	Sethumadai 8, 9, 11. Uppar 4.

SECTON 4—ANALYSIS AND VALUATION OF THE CROP.

692. *Stockmapping.*—The areas proposed for inclusion in the working circle have been stockmapped occularly and only areas considered suitable for planting with *Eucalyptus hybrid* have been included. In general, soils with a pH range of 4 to 7 have been included; soils outside this range are excluded as they are unsuitable for *Eucalyptus tereticornis* which forms the chief compponent of the hybrid variety.

693. *Valuation of the crop.*—No detailed enumeration or valuation of the crop was done, as this was not considered necessary.

SECTION 5—METHOD OF TREATMENT.

694. *Silvicultural system.*—The silvicultural system adopted will be the clear felling system ' followed by systematic artificial regeneration of the coupe with *Eucalyptus* hybrid. Certain ' reserved species ' for e.g., Tamarind, *Sapindus emarginatus*, *Terminalia chebula*, *Feronia limonia*, *Madhuca indica* and *Pongamia pinnata* occurring in the coupe will be however not felled in view of their importance as minor forest produce yielders.

695. *Choice of species.*—The species chosen for planting the clearfelled areas will be *Eucalyptus* hybrid (of the Chickballapur variety).

696. *Rotation.*—For a purely fuel species, the ideal rotation would be the age at which the mean annual increment culminates, since we aim at maximum volume production. The rate of increment of *Eucalyptus* hybrid is however not known due to lack of sufficient data. The species is very fast grown as indicated from the plantations raised so far and a short rotation is therefore feasible. Tentatively a rotation of 10 years is fixed in the absence of any data. The rotation may be subjected to revision later if considered necessary.

697. *Regulation of the yield.*—The yield will be regulated by area. In each felling series, therefore, the size of the annual coupe is obtained by dividing the total area by the period of the rotation.

SECTION 6—METHOD OF EXECUTING FELLINGS.

698. *The annual coupe and its lay out.*—The annual coupe will be demarcated on the ground in accordance with felling series mya be cut lines, 2 metres in width, except where the boundary is well defined by natural features. Enumeration of ' reserved species ' and border trees will be done in the same way as prescribed in the chapter on Fuel Working Circle.

699. *Division into strips.*—Each coupe will be divided into strips. Coupes below 20 hectares in extent will be divided into two strips, while coupes above 20 hectares in extent will be divided into three strips. The strip lines will be cut by lines 1 metre wide.

700. The cut materials obtained while clearing the coupe and strip lines will belong to the contractor who takes the coupe.

701. The sequence in which the strips are to be worked will be left to the discretion of the District Forest Officer.

702. The survey and demarcation will be completed by the end of December of the year previous to felling. The coupe surveys and enumeration lists of 'reserved species' and border trees will be checked by the District Forest Officer or his Assistant before they are put up for sale.

703. *Agency of exploitation.*—The coupes will be worked through the agency of contractors.

704. *Period of lease.*—The coupes will be put up for sale in January or early in February so as to provide time for re-sale by auction or by tender if prices obtained at the first sale are not satisfactory. The coupes will be conveyed to the lessee on the 1st of April. The usual voidah given to coupes belonging to the Fuel Working Circle (*vide* paragraph 651) is prescribed.

705. *Felling and extraction rules.*—The felling rules will be the same as prescribed under paragraph 653 in the chapter on Fuel Working Circle.

706. *Supply of agricultural implements.*—The contractor shall at all times during the period of his contract sell to ryots on demand for their bonafide domestic and agricultural purposes all kinds of produce in the coupe at rates to be fixed by the District Forest Officer in consultation with the Collector.

707. The Contractor shall also be bound to supply to members of the Jaggery Co-operative Societies on demand, brushwood such as thorns and twigs of 15 centimetres and below in girth at such rates as may be fixed by the District Forest Officer in consultation with the Collector.

SECTION 7—TABULAR STATEMENT OF FELLINGS.

708. The following statements show details of the coupes to be felled annually during the next ten years in each of the felling series included in the Eucalyptus Hybrid Working Circle. If a coupe of a year lies in two or more different bits, the sub-coupes are designated by suffixing letters 'a', 'b', etc., to the coupe number :—

Year of felling. (1)	*Coupe number.* (2)	*Compartment in which the coupe lies.* (3)	*Area in hectares.* (4)	*Age of plantation at felling.* (5)	*Remarks.* (6)
		(*a*) POTHAMADAI FELLING SERIES.			
1965–66 ..	I	Sethumadai 1, 2	24·5	..	
1966–67 ..	II	Do. 1	25·0	..	
1967–68 ..	III	Do. 1	25·0	..	
1968–69 ..	IV	Do. 1	25·0	..	
1969–70 ..	V	Do. 1	24·5	..	
1970–71 ..	VI	Do. 1	25·0	..	
1971–72 ..	VII	Do. 3	26·5	11	
1972–73 ..	VIII (*a*)	Do. 2, 3	17·0	12	
1972–73 ..	VIII (*b*)	Do. 2	9·5	10	
1973–74 ..	IX	Do. 1, 2	31·0	11, 10	
1974–75 ..	X	Do. 1, 2	26·5	11, 10	
		(*b*) GUDARAVALLI FELLING SERIES.			
1965–66 ..	I	Sethumadai 4, 5.	29·0	..	
1966–67 ..	II	Do. 4, 5	29·0	..	
1967–68 ..	III	Do. 5	29·5	..	
1968–69 ..	IV	Do. 5	29·5	..	
1969–70 ..	V (*a*)	Do. 6	17·0	..	
1969–70 ..	V (*b*)	Do. 4, 5	13·0	..	
1970–71 ..	VI	Do. 5	29·0	10	
1971–72 ..	VII	Do. 5, 6	28·0	11	
1972–73 ..	VIII	Do. 5, 6	29·5	12, 11	
1973–74 ..	IX	Do. 4, 5	26·5	11, 10, 9	
1974–75 ..	X	Do. 4	26·5	11, 10, 9	

(c) AYEBANGAL FELLING SERIES.

1965–66	..	I	Sethumadai	8, 9	29·0	..
1966–67	..	II	Do.	8, 9	28·5	..
1967–68	..	III	Do.	9	29·0	..
1968–69	..	IV	Do.	8, 9	29·0	..
1969–70	..	V	Do.	8, 9	28·5	..
1970–71	..	VI	Do.	9, 11	26·5	..
1971–72	..	VII	Do.	8	30·5	11
1972–73	..	VIII (a)	Do.	8, 9	17·5	12
1972–73	..	VIII (b)	Do.	8	11·5	10
1973–74	..	IX	Do.	9, 11	30·0	13, 9, 8
1974–75	..	X (a)	Uppar	4	14·0	12
		X (b)	Do.	4	14·0	12

709. The annual areas to be felled in each series have been marked on the management maps prepared and appended to this plan.

SECTION 8.—REGULATION OF REGENERATION OPERATIONS.

710. *Method of regeneration.*—The areas constituted under this working circle all lie in the Pollachi Range where the *kumri* method of regeneration has been successfully established in regenerating fuel species. The same is therefore prescribed for continuance in view of its obvious benefit to both the ryot as well as the department. *Kumri* cultivation will be allowed for a period of 3 years after the year of felling, as is now the practice in the areas worked under the Fuel Working Circle. The right for *kumri* will be sold in auction as there is a keen demand for it among the local folk.

711. While the planting and nursery works, and replacement of casualties will be done by the department, preparation of the planting site, weedings and soil working will be done by the *kumridars* free of cost to Government. A regular agreement will be signed by the District Forest Officer with the *kumridars* as required under the Madras Forest Act, and a surveyed sketch of the regeneration area attached to it.

712. *Preparation of the planting site* (a) *Burning.*—The *kumridars* shall cut all standing growth in the area including regrowth except the 'reserved trees'. Even old coppice stools will be uprooted in order to facilitate ploughing. All this material along with the felling slash will be heaped and burnt before the end of April. Any unburnt material will be billeted and reburnt.

(b) *Ploughing.*—The *kumridar* will then plough or otherwise prepare the soil over the entire regeneration area to facilitate sowing of field crops. Where no ploughing is possible, hoes or other digging implements may be used.

(c) *Aligning and staking.*—An espacement of 3 metres by 3 metres will be adopted. Closely following ploughing, the area will be aligned and staked at this espacement and pits. 3 metre cube will be dug at each stake.

(d) *Planting.*—The first south-west monsoon showers are received in the Pollachi Range late in May or in early June. Container plants of *Eucalyptus* hybrid, 22 to 30 centimetres high will be planted on receipt of the first showers of the monsoon, in the pits dug and kept ready. Immediately before planting, about 25 grams of 10 per cent Heptachlor, Chlordane or Aldrex dust will be well mixed with the soil in each pit in order to prevent termite damage. The actual planting technique will be as follows: The Polythene container will be ripped open at the bottom and in a longitudinal direction along one side by means of a sharp blade, and lowered down the pit hodling the ball of earth in tact with the other hand. The pit will then be filled with earth and the torn container slowly lifted leaving the ball of earth in the pit in tact.

SECTION 9—NURSERY.

715. *Seed collection and storage.*—*Eucalyptus* hybrid seed will be collected locally from the plantations around Sethumadai. These plantations were originally raised from seeds collected from Chickballapur in Mysore and are said to represent a hybrid stock. A study of the plantations reveal that they essentially consist of various stages of hybridisation of the following three *Eucalyptus* species: *Eucalyptus tereticornis*, *Eucalyptus camaldulensis and Eucalyptus robusta.* However of the three, *Eucalyptus tereticornis* seems to represent bulk of the hybrid proportion as most of the characteristics resembles this species. It is also observed that plants with a close resemblance to *Eucalyptus tereticornis* are generally the most vigorous in rate of height and diameter growth and appear to be best suited to the locality, although there is little difference in the suitability of each of these hybrid varieties as fuelwood (*vide* paragraph 505 of Chapter VI of Part I.) Seeds should be therefore collected only from such plants. While of course it will not be possible for a Forester on a Forest Guard to identify amidst the profusion of species and the complex problem of hybridisation, the specific characters of *Eucalyptus tereticornis* through its bark, flower buds, capsules and juvenile leaves as they are normally done, it should not be difficult for anyone to choose the most vigorous plants in any plantation for collection of seed.

714. Due to admixture of other species, there is every likelihood of some throw back to the parental forms in the seed. This is seen by the varying forms of seedlings observed in the nursery even from seed of the same plant. A careful selection of the seedlings in the nursery, rejecting the malformed, crooked and less vigorous ones at the time of planting will help in further natural selection to eliminate the less vigorous forms.

715. Due to hybridisation of different species, the plants do not seem to have a definite period of flowering. Sporadic flowering seems to take place in old trees throughout the year. Some plants are not seen to flower at all. As to whether this is case of sterility endowed by hybridisation, needs further research and study. Due to flowering all round the year, there is no difficulty in seed collection at all.

716. Mature capsules will be collected by climbing the selected trees and vigorously shaking the branches. The capsules will then be dried, broken and the seed separated from the chaff, and stored in tin containers.

717. *Formation of beds.*—Nursery beds of the standard size (12 metres by 1.2 metres by 3 metre) will be prepared in the same way as described in the Chapter on Teak Working Circle in a suitable locality near the regeneration area. The formation of beds should be completed by the end of December.

718. *Sowing.*—Eucalyptus seeds being very minute, they should be mixed with sand or fine earth before they are broadcast sown on beds. For a standard bed of 12 metres by 1.2 metres, about 50 grams has been found to be quite sufficient in local experience. The sowing must be completed by January.

719. Ants carry away the seeds of *Eucalyptus* hybrid often causing low germination percentage. They can be effectively prevented by mixing one teaspoonful of Folidol in a bucketful of water and spraying the solution on each bed before sowing. A couple of sprayings after sowing will be also necessary. The Folidol will also present chafer damage to the seedlings after germination. The subordinates in charge of nursery work should be however specially instructed to handle Folidol carefully as it is highly poisonous.

720. No shading of the beds is necessary. The beds will be watered until germination is observed. The watering should be continued even thereafter on non-rainy days, but sparingly enough in order to prevent excessive growth.

721. *Preparation of container plants.*—When the seedlings are about 5 to 10 centimetres high, they will be removed from the beds and transferred to polythene containers filled with good clayey loam soil and kept ready. Special emphasis is laid in keeping the consistency of the earth a little clayey, in order to prevent the clod from crumbling when the

containers are removed while planting. The containers should be of 150 guage, 25 centimetres in length and 12½ centimetres in diameter. The container plants will be kept under shade until they strike root after which they should be kept in the open. The plants will be watered sparingly in order to acclimatise them to field conditions. Termites often cause damage to container seedlings. The damage can be minimised by drenching the containers once in a fortnight with a wettable solution of 50 per cent Benzene Hexachloride or Hexidol at 1 kilogram in 200 litres of water. A standard bed of 12 metres by 1.2 metres will yield about 4,000 container plants and hence for an espacement of 3 metres by 3 metres, one standard bed will be sufficient for planting three hectares including replacement of casualties.

SECTION 10—SUBSIDIARY SILVICULTURAL OPERATIONS.

722. *Replacement of casualties.*—During the first year, casualties will be replaced as and when they occur so that adequate regeneration will result by the end of the year.

723. Casualties of the first year will be also replaced during the second year along with the south-west monsoon.

724. *Tending.*—As the plantations are proposed to be raised under *kumri*, no special weeding cycle is necessary. The *kumridars* will be insisted upon to keep the plants well weeded during their tenure of 3 years. No special prescriptions are also made for soil working, as the soil working done to the agricultural crop will be beneficial to the forest crop also.

725. *Thinnings.*—As the plantations are grown for fuel on a short rotation, no thinnings are considered normally necessary.

SECTION 11—OTHER REGULATIONS.

726.—*Plantation boards.*—Every plantation should carry at the salient corners of its periphery, conspicuous boards showing the calendar year of its formation and its area. Such of these boards that require renovation or replacement will be attended to in the month of April every year.

727. *Inspection paths.*—Permanent and properly graded inspection paths, 2 metres in width, will be formed in each plantation and kept clear of all growth to facilitate inspection.

728. *Closure to grazing.*—All plantations will be closed to grazing for a period of 5 years including the year of felling.

729. *Fire protection.*—No special fire protection measures are considered necessary. It is considered that an annual clearing of the plantation boundaries and inspection paths will be quite adequate to prevent the entry of any chance fires.

SECTION 12—CONTROL.

730. A control book, record of works, register of deviations, control journal, control maps, plantation and nursery journals will be maintained for this working circle. The manner in which these records are to be maintained are indicated in sections 22 and 23 under the chapter on Miscellaneous Regulations.

CHAPTER VI—WORKING PLAN FOR THE IRRIGATED TEAK PLANTATION WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

731.—*Objects of management.*—The main object of this working circle is to ensure the production of teak poles on a short rotation by the method of irrigation, for catering to the state rural electrification schemes and to a certain extent for local use.

732. *General constitution.*—The working circle will include the areas below the Aliyar Feeder Canal and Sethumadai Canal in the Pollachi Range which can be irrigated by the water passing through these canals. These areas which formed part of the Fuel Working Circle in the past plan consist of plantations of various species. Irrigation will enable growing of teak in these areas on a short rotation for production of poles.

733. *Area.*—The area of this working circle is 115 hectares.

734. *Character of the vegetation.*—The areas included in this working circle consist of plantations of varying ages of various species such as *Azadirachta indica*, *Acacia arabica*, *Tamarindus indica*, *Albizzia lebbek*, *Salmalia malabarica*, *Tectona grandis*, *Dalbergia sissoo*, *Dalbergia latifolia* and *Eucalyptus* hybrid raised either singly or in mixtures. Details of the plantations raised are given below :—

	Area in hectares.
Mixed fuel plantations of Neem, Tamarind, *Acacia arabica* and *Albizzia lebbek* raised prior to 1939.	23·0
Eucalyptus hybrid raised between 1960 and 1964	67·5
Salmalia malabarica raised during 1957 and 1958	9·5
Miscellaneous fuel and hardwood plantations of species such as Teak, Rosewood, Neem, Tamarind, *Dalbergia sissoo*, *Terminalia tomentosa* and *Pterocarpus marsupium* raised between 1956 and 1959	15·0
Total ..	115·0

SECTION 2—BLOCKS AND COMPARTMENTS.

735. The areas included in this working circle lie in Sethumadai 12 and portions of Sethumadai 8 and 11 and Uppar 1 and 2. The details of the areas included under this working circle in each of these compartments are given in Appendix I and shown on the respective management maps.

SECTION 3—DIVISION OF THE AREA.

736. *Division into planting series.*—The total area covered by this working circle being small, it will constitute only one planting series, viz., the Pollachi Irrigated Teak Plantation Series.

SECTION 4—ANALYSIS AND VALUATION OF THE CROP.

737. *Stock mapping.*—The areas proposed for inclusion in this working circle have been ocularly stockmapped and only areas suitable for planting with teak have been included.

738. *Valuation of the crop.*—Detailed enumeration or valuation of the forests proposed for conversion were not done as they were not considered necessary.

SECTION 5—METHOD OF TREATMENT.

739. *Silvicultural system.*—The silvicultural system followed will be the clearfelling system in which the existing crop will be clearfelled and planted with teak under the method of irrigation.

740. *Choice of species.*—Teak will be the main species used in regenerating the clearfelled areas. In slightly elevated patches where irrigation water does not reach. *Eucalyptus* hybrid will be planted. In low portions tending to be swampy, *Terminalia tomentosa* will be planted.

741. *Rotation.*—In the Hulikal teak plantations of Coimbatore Central Division, experience has shown that a rotation of 20 years is quite suitable for pole production of teak grown under irrigated conditions. In the absence of any previous experience of growing teak under irrigated conditiosn in the locality, a rotation of 20 years is tentatively fixed. The rotation may be refixed later, if considered necessary.

742. *Regulation of the yield.*—The yield will be regulated by area. The total area of the felling series will be therefore divided into 20 equi-productive coupes and one felled and planted every year. This would amount to an annual regeneration area of 5.75 hectares. The distribution of regeneration over the entire rotation period will help to avoid the felling of existing plantations of miscellaneous species at an immature age, and also facilitate watering and maintenance.

SECTION 6—METHOD OF EXECUTING FELLINGS.

743. *Selection of the annual coupe.*—The annual coupes are not marked on the map, as the selection of the area to be felled and regenerated will have to be done after coming to an agreement with the Public Works Department regarding the position of the sluices. Since the entire country included in this working circle is cut up by a number of small streams, the position of each sluice will have to be so designed as to irrigate a given portion of the land without resorting to construction of a lengthy main canal parallel to the Parambikulam-Aliyar Project Canal and crossing the small streams by means of costly aqueducts. The annual regeneration area will also have to be selected as to provide for felling of the older plantations earlier without unduly sacrificing any of the younger plantations of miscellaneous species.

744. *Survey and demarcation.*—The annual coupe will be surveyed and demarcated by cut lines 2 metres in width. As the coupes are less than 20 hectares in extent, division into strips is not necessary. The cut materials obtained while clearing the coupe lines will belong to the contractor who purchases the coupe in auction.

745. The survey and demarcation will be completed by the end of December of the year previous to felling. The coupe survey will be checked by the District Forest Officer or his Assistant before they are put up for sale.

746. *Agency of exploitation.*—The coupes will be exploited through the agency of contractors.

747. *Period of lease.*—The period of lease will be not more than 9 months from 1st April to 30th September. No extension of *voidah* will be granted under any circumstances, as this will upset the time schedule for the preliminary regeneration operations and thereby delay the planting.

748. *Felling rules.*—The contractor will be required to cut all growth within the coupe. He may even uproot all the stumps if he so desires, but in order to reserve sufficient material on the ground to ensure a burn, twigs and branches below 25 centimetres in girth should not be removed. For this purpose, removals by headloads will be prohibited.

749. If there is any likelihood of the contractor being unable to finish the work of felling and removal within the allotted period, the produce left over if any will be forfeited to Government, and any or all the operations done departmentally.

SECTION 7—REGULATION OF REGENERATION OPERATIONS.

750. *Method of regenertion.*—The areas included in this working circle enjoy a rainfall of about 80 centimetres received from both the monsoons. Even without irrigation, plantations of teak raised in the Pollachi Range are quite successful, although teak can be said to do best when raised under rainfall conditions of 175 to 250 centimetres. The rate of growth for the first two years in the Pollachi plantations is even faster than what is observed in the Ulandi Block (apparently due to soil working on account of *kumri*), but the plants have a tendency to become branchy as they grow older, which may be due to factors of soil and espacement. Under irrigated conditions, teak is bound to do even better as the deficiency in natural precipitation will be made up. It is therefore proposed to make use of the water available in the Parambikulam-Aliyar Project canals for irrigation wherever such facilities exist, and thereby raise teak plantations of good quality.

751. The Chief Engineer, Parambikulam-Aliyar Project, has tentatively agreed to let off only 4 cusecs of water. This will be just sufficient for the tree crop. However if the Public Works Department are agreeable to letting of more water, *kumri* cultivation of a dry crop can be thought of, as it will be beneficial to the plants. The right to *kumri* can then be sold in auction, as there is a keen demand for *kumri* cultivation in the Pollachi Range. This will bring in additional revenue to the department, incidental to free weedings and soil working of the tree crop. *Kumri* cultivation can be allowed only during the first year. Second year cultivation may not be possible, as the espacement is not wide and the tree crop is bound to grow up very fast as a consequence of irrigation.

752. *Preparation of the planting site.*—(a) *Burning.*—Soon after the contractor has vacated the coupe, the regrowth if any will be cut back and allowed to dry. The felling slash and cut materials will be evenly spread all over the area and burnt during February. The unburnt materials will be billetted, heaped and burnt. The work will be completed by the end of February. Both these operations will be done under supervision.

(b) *Formation of sluices and canals.*—Irrigation by percolation will be followed as the standard method. Water will be taken from the Parambikulam-Aliyar Project canals through sluices constructed at points agreed upon mutually in consultation with the Public Works Department. A short main canal leading from each sluice will be formed from which water will be led through subsidiary channels following an easy gradient on the ground. From the subsidiary channels, feeder canals will be formed to the extent necessary to reach all the plants at suitable intervals. A narrow fringe of area of 1 to 2 chains width immediately adjoining the lower side of the Parambikulam-Aliyar Project Canal cannot be subjected to gravity irrigation, as the level of the sluice which has to be formed at the bottom of the canal will be at a lower level. Such areas will have to be watered by means of hoses directly from the canal or by hand watering. In Uppar 1 and 2, where the irrigable area below the canals is very narrow, no sluices are necessary as watering can be done through hoses by siphon arrangement or even by hand watering. A subsidiary canal to which the siphon can lead to with feeder canals to reach the individual plants is all that is necessary. The construction of sluices and canals will be progressively done as the regeneration extends. The canal work in respect of the annual regeneration area however should in any case be completed before the end of March.

(c) *Aligning and staking.*—The espacement adopted will be 1.8 metres by 1.8 metres. A wider espacement is not suggested as teak in Pollachi Range has a tendency to go branchy. The area will be aligned and staked by the 31st of March at the latest.

753. *Planting.*—The areas included in this working circle receive rains from both the monsoons. Natural teak in the region comes into leaf in April-May. As such, planting must be done early in May when the pre-monsoon showers are received. A couple of days prior to planting, an area of 0.6 metre radius around the stakes will be scraped of all weeds. The early pre-monsoon showers are sometimes likely to be very light and thereby not sufficient to drench the soil to enable digging of crow bar holes. It will be therefore necessary to let out water in the canals a couple of days before planting in order to wet the ground properly. One year old teak stumps about 25-1/2 centimetres long with 23 centimetres of root and 2.5 centimetres of shoot, and 1 to 2 centimetres thick at the collar, prepared from nursery raised seedlings, will be put in crow bar holes made at each stake. The stumps will be planted firmly taking care to see that no air space is left between the stump and the soil.

754. Elevated patches where irrigation water cannot reach, will be planted with container plants of *Eucalyptus* hybrid. Similarly, swampy localities will be planted with stumps of *Terminalia tomentosa*.

755. Original planting of teak or miscellaneous species will be done always on one definite side of the stake so that replacements can be done on the other.

SECTION 8—NURSERY.

756. Nurseries will be required for raising stumps of teak and *Terminalia tomentosa* and container plants of *Eucalyptus* hybrid. The nursery technique for teak and *Terminalia tomentosa* has already been described in detail under the chapter on Teak Working Circle. The nursery technique for *Eucalyptus* hybrid also has been described under the chapter on *Eucalyptus* Hybrid Working Circle. The nursery techniques are therefore not repeated here.

SECTION 9—SUBSIDIARY SILVICULTURAL OPERATIONS.

757. *Watering.*—In the absence of any previous experience of raising irrigated teak plantations in the locality, the watering regime prescribed will be the same as for the Odanthurai teak plantations in Coimbatore Central Division. This may be modified and improved upon gradually with experience. The watering regime is described below.

758. During the first year, watering will be done once in ten days by flood irrigation, care being taken to see that each plant gets sufficient wetting. The whole area will be flooded and water allowed to soak more than an hour, so that the water reaches the individual plants. Areas immediately adjoining the lower side of the Parambikulam-Aliyar Project canals and cannot be irrigated by water flowing through the sluices, due to their location above the sluice level, should be watered by means of hoses directly from the Parambikulam-Aliyar Project canal, or hand watering. Similarly, on minor undulations within the regeneration area where gravity irrigation may not suitably work, pot watering is suggested. For the subsequent years, the watering regime will be as follows :—

Second year—Once in a fortnight.

Third year—Once in a month.

Fourth year—Once in 1½ months.

Watering beyond the fourth year, is an issue open for decision based on future observations.

759. Watering will be essentially done during the dry months with the cessation of the north-east monsoon, until the outbreak of the south-west monsoon. Watering may be also necessary during the rainless break of two months between the south-west and north-east monsoons. In either case, if any chance showers are received, watering may be stopped for 10 to 15 days until another watering is indicated.

760. The canals will be cleared twice in the year. Other items of maintenance such as strengthening of bunds, stopping of breaches and removal of obstructions will be attended to whenever necessary.

761. *Replacement of casualties.*— During the first year, replacement of casualities will be done first in July. Inasmuch as watering is provided, further replacement of casualities as and when they occur may be attended to, as this will help in ensuring full stocking.

762. During the second year, individual casualities will not be replaced but extensive areas of failures should be replaced.

763. *Tending.*—If *kumri* cultivation is made possible, the weedings will be got done free by the *kumridars.* The *kumridars* will be responsible to keep the plants weeded at all times. Repeated soil working done for the agricultural crop will benefit the tree crop also. No special prescriptions are therefore made for soil working.

764. When *kumri* cultivation is not done, the weedings and soil working will have to be done departmentally. The following are prescribed :—

(*a*) *First year.*—Three knife weedings will be done during the first year. The first weeding will be done during June–July, the second in October–November and the third in January–February. During the course of the first weeding, thorny species occurring all over the area will be uprooted.

Two soil workings to a radius of 30 centimetres around the plants will be done during the first year. The first one will be done in September and the second in December—January.

(*b*) *Second year.*—During the second year also, 3 knife weedings will be done as in the first year. Only one soil working to a radius of 30 centimetres will be done in September.

(*c*) *Third year.*—During the third year, only two knife weedings will be done. The first weeding will be done in June—July and the second in October—November.

765. The weeding and soil working schedule given here is purely empirical so as to serve only as a guide. With gradual experience, these operations will have to be modified so as to suit local conditions.

766. *Thinnings*—(*a*) *Thinning interval.*—Three thinnings are prescribed at the ages of 4, 7 and 13 respectively. The thinning regime is fixed empirically in the absence of any previous experience and may be subjected to revision later, if found necessary.

(*b*) *Thinning degree.*—The first two thinnings will be mechanical and will be expressed as an S-percentage of the top height.

767. The first mechanical thinning will consist of removal of all plants in the alternate diagonal rows by which an espacement of 2.55 metres by 2.55 metres and reduction in the stocking by 50 per cent would result. The second mechanical thinning will consist of removal of all plants in the alternate planting lines, by which an espacement of 3.6 metres by 3.6 metres would result with a reduction in stocking by a further 50 per cent.

768. The 3rd thinning will be silvicultural. A 'C' grade intensity is suggested. Heavier thinnings are not suggested, as teak in Pollachi Range has a tendency to branch heavily.

769. *Marking rules for thinning.*—The first and second thinnings which are mechanical will be carried out by the Range Officer. Marking for the third thinning which is silvicultural, will be done by the District Forest Officer or his Gazetted Assistant.

770. A climber cutting and removal of *Dendrophthoe* or other parasites on the trees will precede every thinning, and the marking officer should ensure that these operations have been carried out properly before he commences marking.

771. *Thinning programme.*—The following statement gives details of the areas to be thinned during the ten year period of this plan. Particulars of areas that will have to be thinned for the next 5 years is also given, in case the revision of the working plan is not taken up in time.

Year of thinning.	*Name and year of plantation.*
1969–70	1965 R.A.
1970–71	1966 R.A.
1971–72	1967 R.A.
1972–73	1965 R.A. 1968 R.A.
1973–74	1969 R.A. 1966 R.A.
1974–75	1970 R.A. 1967 R.A.
1975–76	1971 R.A. 1968 R.A.
1976–77	1972 R.A. 1969 R.A.
1977–78	1973 R.A. 1970 R.A.

Year of thinning.	*Name and year of plantation*
1978–79	1974 R.A. 1971 R.A. 1965 R.A.
1979–80	1975 R.A. 1972 R.A. 1966 R.A.

NOTE.—The area and locality of the plantations are not noted as it would not be correct to furnish them before their formation.

772. *Exploitation of thinned produce.*—The thinned produce will be converted into poles and fuel adopting the same classification as detailed under the Teak Plantation Working Circle.

773. The first two thinnings are not likely to yield any electric transmission poles. They will be therefore sold in auction to the public. Trees suitable as electric transmission poles obtained during the 3rd thinning will be separated and converted according to the specifications laid down by the Forest Utilisation Officer, Madras and made available to the Electricity Board under his directions. The rest of the poles and the fuel obtained from conversion of top-ends will be sold in auction.

SECTION 11—OTHER REGULATIONS.

774. *Plantation boards.*—Every plantation should carry at the salient corners of its periphery, conspicuous boards showing the calendar year if its formation and its area. Such of these boards that require replacement will be renewed in the month of April every year.

775. *Inspection paths.*—Permanent and properly graded inspection paths, two metres in width, will be formed in each plantation and kept clean of all growth to facilitate inspection.

776. *Closure to grazing.*—All plantations will be closed to grazing for a period of 5 years including the year of felling.

777. *Fire protection.*—No special fire protection measures are considered necessary. It is considered that an annual clearing of the plantation boundaries and inspection paths will be quite adequate to prevent the entry of any chance fires.

778. *Staff.*—A staff of one Forester may be provided at the inception exclusively for the works connected with this working circle. The staff may be increased by two Forest Grades as the regeneration work extends, in order to provide for maintenance of the older plantations.

SECTION 12—CONTROL.

779. A control book, record of works, register of deviations, control journal, control maps, plantation and nursery journals will be maintained for this working circle. The manner in which these records are to be maintained are indicated in sections 22 and 23 under the chapter on Miscellaneous Regulations.

CHAPTER VII—WORKING PLAN FOR THE REHABILITATION WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

780. *Objects of management.*—The main object of this working circle is to rehabilitate the degraded ex-panchayat forests of the region by artificial regeneration of fuel species which are best suited to the tract and thereby increase the fuel and small timber supply to the towns and villages adjoining these forests. These forests which were resumed by

the Forest Department in 1951 in a virtually treeless condition, have improved since then due to the protection afforded, but it is very necessary that all suitable open spaces are artificially regenerated in order to achieve complete rehabilitation. As these forests are situated right on the plains amidst practically treeless country, any money usefully spent in improving these areas is bound to give ample returns when the plantations raised come for felling.

781. *General constitution.*—This working circle will include such of those areas in the ex-panchayat forests of Dharapuram taluk considered suitable for regeneration. The working circle will also include areas in the Dalavoipatnam Block which were subjected to artificial regeneration in the past, but with unsuccessful results. Areas successfully regenerated in the past have been however excluded.

782. *Area.*—The total area of this working circle is 320.5 hectares.

783. *Character of the vegetation.*—The type of forest met within the greater portion of this working circle is the one referred to by Champion as the 'Carnatic Umbrella thorn forest', although portions of the Uthiyur Block can be said to possess a ' Southern Cutch thorn type'. In the 'Carnatic Umbrella thorn forest', *Acacia planifrons* forms a good proportion of the overwood but is associated often with thickets of *Acacia latronum.* In the 'Cutch thorn type', several thorny species belonging to the genus *Acacia* (chiefly *Acacia latronum*) occur, with some admixture of other species such as *Albizzia amara, Wrightia tinctoria, Commiphora berryi, Protium caudatum,* etc. In both the types, the undergrowth is scanty and consist of only thorny shrubs. A fuller description of both the forest types is given in Chapter II of Part I.

SECTION 2—BLOCKS AND COMPARTMENTS.

784. The compartments in which this working circle is constituted are given in paragraph 785. The details of the areas included under this working circle in each of these compartments are given in Appendix I and shown on the concerned management maps.

SECTION 3—DIVISION OF THE AREA.

785. *Division into planting series.*—The area covered by this working circle is divided into two planting series with a view to distribute the centres of regeneration to two different beats. The following statement gives details of the two planting series :—

Serial number.	*Name of planting series.*	*Compartments in which the series occurs.*	*Area in hectares.*
(1)	(2)	(3)	(4)
1.	Uthiyur	Dalavoipatnam 1 Uthiyur 1, 2	124·5
2.	Garudankottai	Periamanimalai 1 Attamalai 1	196·0

SECTION 4—ANALYSIS AND VALUATION OF THE CROP.

786. *Stockmapping.*—The areas proposed for inclusion in this working circle have been carefully stockmapped and only such of those areas suitable for regeneration have been included. Predominantly rocky or bouldery sites unsuitable for artificial regeneration have been excluded. Small patches of rock or boulders within the area included will have to be however omitted by the District Forest Officer during the course of actual planting as it was not possible to exclude them in the course of ocular stockmapping. The existing growth over the area varies from virtual blanks to areas with shrubby coppice growth of mostly useless species interspersed by an occasional tree. Planting will have to be confined to the vacant spaces where no vegetation exists.

787. *Valuation of the crop.*—As the areas included in this working circle do not any exploitable growth, no valuation surveys were considered necessary.

SECTION 5—METHOD OF TREATMENT.

788. *Silvicultural system.*—The silvicultural system adopted will be to artificially restock these degraded areas with suitable fuel species supplementing whatever natural regeneration that may occur. Owing to maltreatment in the past, the forest is open with wide inter-spaces. Heavy grazing and trampling by cattle, and exposure to the sun have rendered the soil hard and impervious, the rather low rainfall received runs off the surface without sufficiently penetrating into the soil, thereby greatly reducing the effective rainfall available for plant growth. The silvicultural system adopted will be therefore to artificially restock these areas with hardy fuel species suitable for the tract, adopting a suitable water conservation technique whereby the rain water is collected and made available for the seedlings raised. The planting will be made at a rough espacement with as little interference as possible with the existing growth.

789. *Choice of species.*—Artificial regeneration work done in the Dalavoipatnam Block during the years 1954 to 1962 have not proved successful, as species such as *Albizzia lebbek*, *Ailanthus excelsa*, and *Dalbergia sissoo* were mostly tried. The areas included in this working circle lie in perhaps the driest portion of Coimbatore district where the average annual rainfall is 53 centimetres. The soil is generally a coarse gravel and very often with a layer of *kankar* underneath. The existing vegetation is chiefly of *Acacia latronum* which is a clear indicator of poor soil conditions. Under such conditions, only very hardy fuel species can really succeed in this area. *Acacia planifrons*, Neem, Tamarind, *Acacia leucophloea* and *Acacia sundra* are therefore suggested for planting. Preferences should be however given to *Acacia planifrons* as it is an indigenous species and has come up very well naturally in portions of the area on account of mere protection afforded during the past few years.

790. *Rotation.*—As the fuel plantations are to be initiated with the enforcement of this working plan, considerations of rotation at the present juncture are only of theoretical interest. Tentatively, a rotation of 30 years will be adopted as for the Fuel Working Circle. The necessity to increase or decrease the rotation period may be however examined at the time of revision of this working plan.

791. *Annual planting area.*—The rotation need not be a factor for deciding the annual planting area, as the object of management is to rehabilitate these forests in as quick a time as possible, subject to administrative convenience and availability of funds. The area of each series being small, the entire area will be planted during the period of this working plan, taking advantage of the funds provided under the Five-Year Plan Schemes. This will amount to an average annual planting area of 12.5 hectares in the Uthiyur Series and 19.6 hectares in the Garudankottai series. This is by no means a difficult target for the local staff.

SECTION 6—TABULAR STATEMENT OF PLANTING.

792. The following statements give details of areas to be planted annually in each of the planting series included in the Rehabilitation Working Circle. If the area to be planted each year lies in two or more separate bits, the sub-coupes are designated by suffixing letters (a), (b), etc., to the coupe number :—

Year of planting. (1)	*Coupe number.* (2)	*Compartment in which the coupe lies.* (3)	*Area in hectares.* (4)	*Remarks.* (5)
		(a) UTHIYUR REHABILITATION SERIES.		
1965	I	Dalavoipatnam 1	11·5	
1966	II	Do. 1	11·5	
1967	III (a)	Do. 1	8·5	
1968	III (b)	Do.	2·5	
	IV	Do. 1	11·0	
1969	V	Do. 1	11·5	
1970	VI (a)	Do. 1	8·5	
	VII (b)	Do. 1	3·0	
1971	VII	Do. 1	11·0	
1972	VIII	Uthiyur 1	15·5	
1973	IX	Do. 1	15·5	
1974	X	Do. 1, 2	15·0	

Year of planting.	Coupe number.	Compartment in which the coupe lice.	Area in hectares.	Remarks.
(1)	(2)	(3)	(4)	(5)
(b) GARUDANKOTTAI REHABILITATION SERIES.				
1965	I	Periamanimalai 1	20.0	
1966	II	Do. 1, 2	19·5	
1967	III	Do. 2	20·0	
1968	IV	Do. 2	19·5	
1969	V	Do. 2	20·0	
1970	VI	Do. 2	20·0	
1971	VII (a)	Attamalai 1	8·5	
	VII (b)	Do. 1	2·0	
	VII (c)	Do. 1	8·5	
1972	VIII	Do. 1	19·5	
1973	IX (a)	Do. 1	11·0	
	IX (b)	Do. 1	8·0	
1974	X	Do. 1	19·5	

793. The annual planting areas in each series have been marked on the management maps prepared and appended to this plan.

SECTION 7—REGULATION OF REGENERATION OPERATIONS.

794. *Survey and demarcation of the annual regeneration area.*—The annual regeneration area will be demarcated on the ground in accordance with the planting series map by cut lines 2 metres wide, except where the boundary is already well defined by natural features. The survey and demarcation must be completed at least 5 months before the actual planting.

795. *Method of regeneration.*—In dry localities such as those included in this working circle, moisture is the limiting factor for achieving any success. As such, adoption of a suitable water conservation technique to collect the maximum quantity of water from monsoon precipitation is essential. The water conservation technique adopted will be the 'saucer' method for flat or nearly flat areas and the 'trench and mound' method for sloping country.

796. *Espacement.*—The espacement adopted will be 3 metres by 3 metres, but the 'saucer' method for flat or nearly flat areas and the 'trench and mound' method for the water that drains down the slope.

797. *Preparation of the planting site.*—(i) *Aligning and staking.*—The regeneration area will be aligned and staked roughly at an espacement of 3 metres by 3 metres, but with as little interference as possible to the existing growth. If the stake falls exactly where there is a seedling or active stool, the stake should be shifted a few feet either way. Espacement therefore need not be rigidly adhered to, as the ultimate object of artificial regeneration is to only supplement the existing natural growth. The forests dealt with are sparsely clothed with wide open spaces; the soil is hard and caked; there is considerable sheet erosion; the summer is prolonged, hot and desiccating; the pre-monsoon winds are also equally desiccating. In such localities vegetation can be quickly destroyed, but its resuscitation is a matter of extreme difficulty and uncertainty, and essentially a tedious and heart breaking affair. As such, any interference to the existing growth is bound to result in disastrous results and is therefore not advocated.

(ii) *Water conservation technique*—(*a*) *'Saucer' method.*—This method will be followed in flat or nearly flat areas. The technique is briefly described as follows: After the area is aligned and staked, pits 30 centimetres cube deep will be dug at each stake and the dug out soil allowed to weather for at least one month. Pitting should be completed by the end of July. By the end of May, the pits will be refilled and saucers 1 metre wide will be made around each pit as shown in figures 1 and 2. The saucers in the succeeding lines will be kept staggered in order to collect all the water that runs along the ground surface.

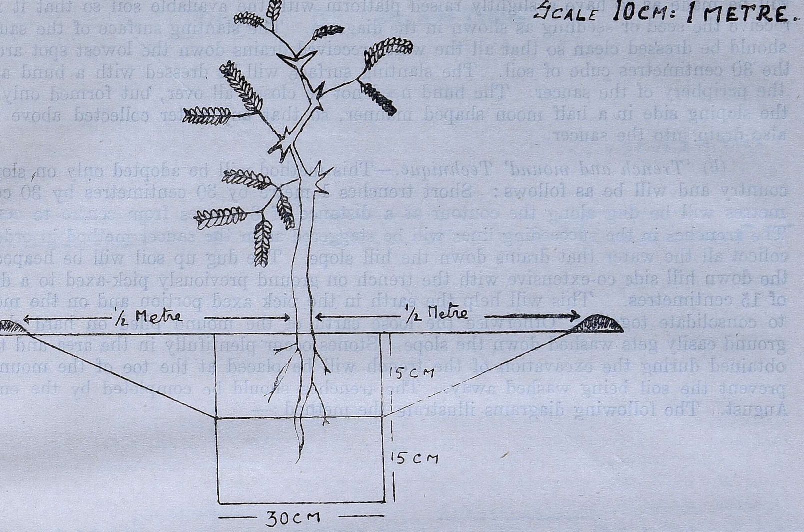
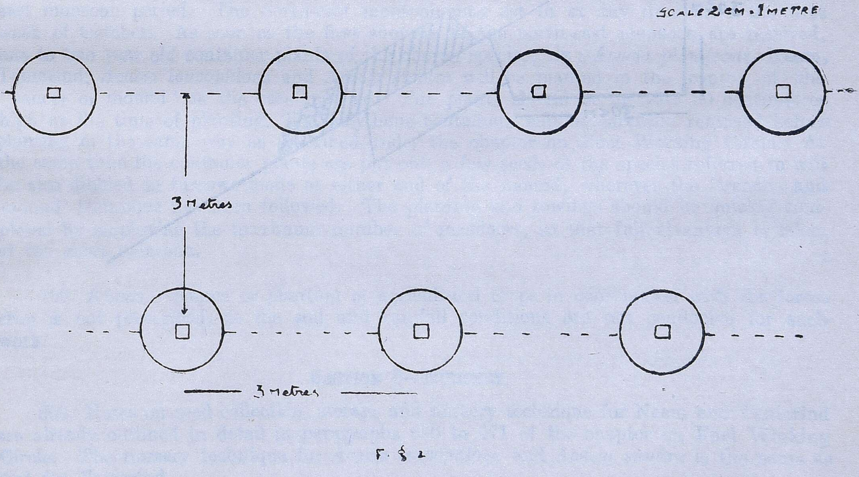

SCALE 10CM: 1 METRE.
½ Metre
½ Metre
15 CM
15 CM
30 CM

Fig 1

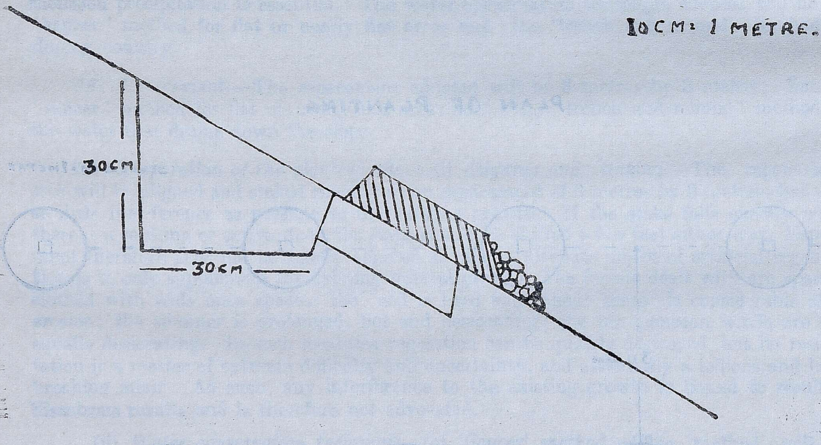
PLAN OF PLANTING.


SCALE 2 CM: 1 METRE
3 Metres
3 Metres

F. g 2

After the saucer is formed around the regeneration spot, the centre of the saucer will be made as to have a slightly raised platform with the available soil so that it may receive the seed or seedling as shown in the diagram. The slanting surface of the saucers should be dressed clean so that all the water received drains down the lowest spot around the 30 centimetres cube of soil. The slanting surface will be dressed with a bund along the periphery of the saucer. The bund need not be closed all over, but formed only on the sloping side in a half moon shaped manner, so that any water collected above may also drain into the saucer.

(b) *'Trench and mound' Technique.*—This method will be adopted only on sloping country and will be as follows: Short trenches 1 metre by 30 centimetres by 30 centimetres will be dug along the contour at a distance of 3 metres from centre to centre. The trenches in the succeeding lines will be staggered as in the saucer method in order to collect all the water that drains down the hill slope. The dug up soil will be heaped on the down hill side co-extensive with the trench on ground previously pick-axed to a depth of 15 centimetres. This will help the earth in the pick axed portion and on the mound to consolidate together. Otherwise the loose earth of the mound piled on hard sloping ground easily gets washed down the slope. Stones occur plentifully in the area and those obtained during the excavation of the trench will be placed at the toe of the mound to prevent the soil being washed away. The trenches should be completed by the end of August. The following diagrams illustrate the method :—



PLAN OF PLANTING

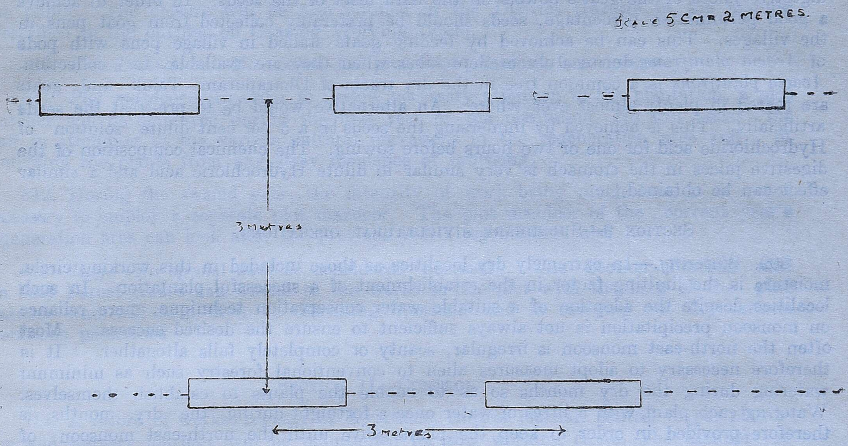


Fig 4

It is essential to note that irrespective of the technique followed, all the preliminary regeneration operations should be completed according to the time schedule laid down in order to take maximum advantage of the short monsoon period.

798. *Planting.*—The areas dealt with receive only a few showers during the north-east monsoon period. The north-east monsoon may set in at any time after the first week of October. As soon as the first showers of the north-east monsoon are received, one to two year old container plants of the chosen species, viz : *Acacia planifrons*, Neem, Tamarind, *Acacia leucophloea* and *Acacia sundra* will be planted in the centre of the 'saucer or mound' as the case may be. The plants should be at least 30 centimetres high at the time of planting. The polythene containers will be carefully removed before planting in the same way as described under the chapter on Fuel Working Circle. At the same time the container plants are put out, a few seeds of the species referred to will be also dibbled in furrows made at either end of the mound, wherever the 'trench and mound' technique has been followed. The planting and sowings should be quickly completed by employing the maximum number of mazdoors, so that full advantage is taken of the short monsoon.

799. *Kumri.*—Kumri or planting of agricultural crops in conjunction with the forest crop is not prescribed, as the soil and rainfall conditions are not conducive for such work.

SECTION 8—NURSERY.

800. Notes on seed collection, storage and nursery technique for Neem and Tamarind are already outlined in detail in paragraphs 666 to 671 of the chapter on Fuel Working Circle. The nursery technique for *Acacia leucophloea* and *Acacia sundra* is the same as that for Tamarind.

801. In the case of *Acacia planifrons,* although the nursery technique is the same as that for the above species, some amount of pre-treatment is necessary before the seeds are sown in the containers. The seeds have a hard outer coat or testa and do not easily germinate unless they are pre-treated. Regeneration of *Acacia planifrons* occurs in nature mostly from seeds eaten up by stray goats and cast out undigested in their faeces. Such seeds germinate quickly due to the pre-treatment they recive by the reaction of the digestive juices of the geat's bowels on the hard testa of the seeds. In order to achieve a good germination percentage, seeds should be preferably collected from goat pens in the villages. This can be achieved by feeding goats stalled in village pens with pods of *Acacia planifrons* during July to September when they are available for collection. *Acacia planifrons* is a common tree in the dry tracts of Dharapuram Taluk and goats are reared in plenty almost everywhere. An alternative would be to pre-treat the seeds artificially. This is achieved by immersing the seeds in a 5 per cent dilute solution of Hydrochloride acid for one or two hours before sowing. The chemical composition of the digestive juices in the stomach is very similar to dilute Hydrochloric acid and a similar effect can be obtained.

SECTION 9—SUBSIDIARY SIVICULTURAL OPERATIONS.

802. *Watering.*—In extremely dry localities as those included in this working circle, moisture is the limiting factor in the establishment of a successful plantation. In such localities despite the adoption of a suitable water conservation technique, mere reliance on monsoon precipitation is not always sufficient to ensure the desired success. Most often the north-east monsoon is irregular, scanty or completely fails altogether. It is therefore necessary to adopt measures alien to conventional forestry such as minimum watering during the dry months so as to enable the plants to establish themselves. Watering each plant with 5 litres of water once a fortnight during the dry months is therefore provided in order to keep the plants alive until the north-east monsoon of the next year sets in. The watering may be however curtailed for a fortnight on receipt of any chance rains during the dry period. Water can be carted in drums to the regeneration site. There is a perennial well in the Dalavoipatnam Block which can provide water all through the year. In the other two reserves there are no wells. Water stagnates in a few ponds during the monsoon but these get dried up during summer. Water has to be therefore fetched from the nearest village which is about two miles. This will be rather difficult and costly. The increase in cost of planting will be about Rs. 125 per hectare, but since the success or failure of regeneration in an otherwise inhospitable site is dependant on this prescription, it is worth trying.

803. *Replacement of casualities.*—During the first year, casualities if any will be replaced a fortnight after planting. No further replacements will be made during the first year, as the monsoon is very brief and the plants are not likely to survive for long.

804. During the second year, casualities of the first year will be replaced during the north-east monsoon.

805. *Tending.*—3 weedings during the first year and 2 weedings during the second year, combined with climber cutting and soil working will be done. The weeding will consist of a scraping of the 'saucers' and 'trenches', and grasses and other herbaceous growth will be removed. During each soil working, the soil will be worked to a depth of 8 to 15 centimetres and a width of 30 centimetres around the plants. The 'saucers', 'trenches' and 'mounds' will be mended and reformed after every soil working.

SECTION 10—OTHER REGULATIONS.

806. *Plantation boards.*—Each year's plantation will be indicated by a small wooden plantation board of uniform size fixed at salient points. The board should indicate in English and in Tamil, the year of formation and the actual area planted.

807. *Fencing.*—A thorn fence will be raised along the periphery of the regeneration area in the year of regeneration. The fence will be maintained during the second and third year also as the plants are likely to be slow grown.

808. *Closure to grazing.*—The regeneration areas will be closed to grazing for a period of 5 years including the year of formation. If in the opinion of the District Forest Officer, certain specified plantations require to be closed to grazing for a longer period for silvicultural reasons, the period of such closure shall be fixed by the Conservator.

809. All closed areas will be distinguished by prominent notice-boards painted red and engraved in white letters in Tamil and in English notifying the fact of closure to the public. The closure will be also notified in the District Gazette in the manner prescribed in the chapter on Grazing Working Circle.

810. *Fire Protection.*—No special fire protection measures are necessary.

811. *Plot mazdoor.*—In order to bestow necessary attention to the plantation, a plot watcher will be employed during the first year of the plantation. He will assist the staff in attending to the various cultural operations in the regeneration area and in protecting the plants from any stray incidence of browsing.

812. During the second year, the intensity of work being much less, it is not necessary to employ a separate plot mazdoor. The plot mazdoor of the current year's regeneration area can look after the previous year's regeneration also.

813. *Staff.*—No special staff is considered necessary. The Section Forester and the beat Forest Guard can attend to the works in the plot with the help of the plot mazdoor who will help them in recruiting mazdoors and in carrying out the various operations prescribed.

SECTION 11—CONTROL.

814. A record of works, register of deviations, control journal, control maps, plantation and nursery journals will be maintained for this working circle. The manner in which these records are to be maintained are indicated in Sections 22 and 23 of the chapter on Miscellaneous Regulations.

CHAPTER VIII—WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

815. *Objects of management.*—The main object of this working circle is to ensure the sustained production of the maximum quantity of bamboos for both industrial and domestic requirements.

816. *General constitution.*—The Bamboo Working Circle comprises of all areas in the Coimbatore South Division wherein bamboos occur in workable quantities. The following areas included in the past plan have been deleted :—

(i) Following gregarious flowering over large areas in the Pollachi, Punachi and Udamalpet Ranges, most of the bamboos have died. Such areas are therefore excluded from working. These constituted the Pothamadai, Villoni, and Thadaganachi series in the Pollachi Range, the Punachi series in the Punachi Range and the Pundi-Vendayam, Esalthittu Mangear, Thalinji and Manjampatti Series in the Udamalpet Range. There is no possibility of regenerating these areas with bamboos, as bulk of the accessible portions in the Pollachi Range have already been clearfelled and planted with other species, while the higher reaches are unsuitable for artificial regeneration work. Natural regeneration that has occurred here is quite inadequate. In the Udamalpet Range, artificial regeneration of bamboos is not practicable due to want of communications.

(ii) On account of a large programme of artificial regeneration followed in the Tunacadavu and Pollachi Ranges during the past decade, considerable areas of natural forests containing bamboos had to be clearfelled for planting with teak and other species.

The series thus affected are the Tunacadavu, Ayerangal Upper, Ayerangal Lower and Pachathanni Series. These areas lie in the Ulandi, Sethumadai, Uppar and Vannanthorai Blocks.

(iii) Since 1958, vast areas in the division have been deforested in order to accommodate the activities of the Parambikulam-Aliyar Project and the Parambikulam-Aliyar Hydel Scheme. The areas thus affected lie in the Mount Stuart, Ulandi, Palakadavu Uppar, Vannanthorai, Thulukkamadai, Thirumurthi, Jallipatti, Lower Punachi and Thorakadavu Blocks. Contiguous stretches of bamboo forests thus deforested have been excluded but small patches deforested in order to accommodate residential colonies, offices, transmission lines, canals, roads, power-house sites, etc., had to be included within the working circle in order to obtain convenient natural boundaries. They are to be however excluded for purposes of calculating the net area of the working circle.

817. It may be therefore seen that there has been a great reduction in the area of the Bamboo Working Circle since the last plan was written.

818. *Area.*—The total area of the working circle is 11,789.61 hectares which includes small patches devoid of bamboo also, but which have been included in order to obtain convenient natural boundaries for purposes of management. The net bamboo bearing area has been estimated to be 9,174 hectares.

819. *Character of the vegetation.*—Both *Bambusa arundinacea* and *Dendrocalamus strictus* are met within the working circle. The former occurs in the moist deciduous type of forest usually to the complete exclusion of *Dendrocalamus strictus*. It also occurs as an edaphic variant in moister localities such as stream banks and sheltered locations in the dry deciduous type, thus abandoning the higher, drier, and better drained slopes for *Dendrocalamus strictus* which is the more predominant bamboo in this type of forest. Wherever they occur, both the species are found in varying proportions in association with other deciduous tree species often forming a distinct understorey, but there are several patches where the bamboo may occur pure without any overwood. While *Bambusa arundinacea* has mostly disppeared in the areas clearfelled and planted with miscellaneous species in the Pollachi Range, it has in many places in the Tunacadavu Range invaded into teak plantations. Such sites include moist or ill-drained locations ecologically unsuitable for teak.

SECTION 2—BLOCKS AND COMPARTMENTS.

820. The names of the compartments constituting this working circle are given in paragraph 821. The areas of each of these compartments are furnished in Appendix I.

SECTION 3—DIVISION OF THE AREA.

821. *Division into felling series.*—The working circle will be divided into four felling series so as to distribute the centres of supply. The Ayerangal Upper and Ayerangal Lower series of the past plan have been merged together as they are too small to constitute two separate series. There is also a substantial decrease in the bamboo stocking of either series owing to large areas having been clearfelled and planted with miscellaneous species during the past decade. The following statement gives particulars of the felling series constituted. The effective area noted against each series is only approximate.

Serial number and name of felling series. (1)	*Area in hectares.* *Gross.* (2)	 *Effective.* (3)	*Blocks and compartments constituting each series.* (4)	*Boundaries.* (5)
			POLLACHI RANGE.	
1. **Ayemangal** .. – ..	1,098·58	680·00	Sethumadai 6 to 12 excluding Sarkarpathi Settlement.	*North.*—The Dawson Road. *East.*—Starting from a point where the Dawson road cuts the outer boundary of the Anamalai R. F., the boundary runs south and south-east along the said reserve boundary until cairn number 111; thence along the inner boundary of the Sarkarpathi settlement until cairn number 121; thence southwards again along the outer boundary of the Anamalai Reserve Forest up to a point in between cairn numbers 124 and 125 where the Aliyar Feeder Canal cuts the reserve boundary. *South.*—From the above said point, the boundary runs westwards along the Aliyar Feeder Canal up to the Sarkarpathy Regulator, and thence along the Vagiriar up to the common boundary between Pollachi and Tunacadavu Ranges. *West.*—The common boundary between Pollachi and Tunacadavu ranges from the Vagiriar up to the Pandaravaramalai; thence the boundary follows the inter-state boundary between Madras and Kerala to a point where the Dawson road enters the Madras State.
2. Pachathanai	2,143·67	1,862·00	**Uppar 1 to 8**	*North.*—The course of the Vagiriar river from a point where it cuts the common boundary between Pollachi and Tunacadavu Ranges up to the Sarkarpathy Regulator; thence along the Aliyar Feeder Canal up to a point midway between cairn numbers 124 and 125 where the said canal emerges out of the outer boundary of the Anamalai Reserve Forest; thence along the said reserve boundary up to a point midway between cairn numbers 221 (a) and 222. *East.*—From the above said point, the boundary follows a prominent ridge running in a south-west direction to the common boundary between Pollachi and Punachi Ranges. *South.*—The boundary then follows the common boundary between Pollachi and Punachi Ranges up to the Nadumalai, thence runs north-west and again southwards along the common boundary between the Anamalai Reserve Forest and the Thalanar Estate up to a point where it meets the common boundary between Pollachi and Tunacadavu Ranges; thence runs westwards along the said common boundary up to a point about 15 chains east of a peak marked on the map as 2703' app. *West.*—The boundary then runs northwards along the common boundary between Pollachi and Tunacadavu Ranges to the starting point.

Serial number aud name of felliug seiies. (1)	Area in hectares. Gross. (2)	Area in hectares. Effective. (3)	Blocks and compartmeuts conetituting each series. (4)	Boundaries. (5)
			TUNACADAVU RANGE.	
3. **Topslip**	**2,599·60**	1,804 00	**Mount Stuart 52, 53, 58 to 80.**	***North and east.***—**Starting from the Pandaravaramalai at the** trijunction of the Kerala State with the **Tunacadavu and** Pollachi Ranges, the boundary runs **east and south-east along the** common boundary **between Tunacadavu and** Pollachi Ranges up to **a peak marked as 4,433' app.** on the management map. ***South.***—From the above said **peak, the boundary runs south and south-west** along the **Umayamalai–Vellimalai ridge up** to Vengolimalai. ***West.***—The inter-State **boundary** between **Madras and Kerala** from Vengolimalai up to Pandaravaramalai.
4. **Ulandi**	**5,944·67**	**4,828·00**	**Ulandi 81 to 90, Palakadavu 91 to 105.**	***North.***—Starting from Vengolimalai, the **boundary runs east-wards along the ridge connecting Anaigundi saddle,** Vellimalai and Umayamalai. ***East.***—From Umayamalai the **boundary runs southwards** along the eastern boundary of Ulandi **83 to meet the Varagaliar** river; the boundary then runs upstream along the course of the Varagaliar to a distance of 40 chains to a point marked as 3,003' app. on the **management map; thence runs** south-east and south along the common **boundary between Palakadavu** and Perumkundru Blocks until **it reaches the** Panatti ar; thence along the course of the said river up to a point marked as 2,095' app. on the management map; thence north-east along the course of a perennial stream arising from a peak marked as 3222' on the management map upto the said peak; thence southwards along a ridge up to a peak marked as 2,930' app. on the management map; thence due south along the course of a stream arising from the same peak until it meets the Parayankadavu river; thence up-stream along the course of the Parayankadavu river to a short distance of about 10 chains; thence due south along the common boundary between Parayankadavu and Palakadavu blocks until it meets the common boundary between the Anamalai Reserve Forest and the Urulikal Estate. *South.*—The boundary then runs south-west along the common boundary between the Anamalai Reserve Forest and the Urulikal Estate until it meets the trijunction point between the Anamalai and Tunacadavu Reserves and the Urulikal Estate; thence again westwards along the common boundary between the Tunacadavu Reserve Forest and the **Urulikal and Sheikalmudi** Estates until it meets the inter-State boundary between **Madras** and Kerala. ***West.***—The inter-State **boundary between Madras and Kerala** from the north western **corner of the Sheikalmudi Estate** up **to Vengolimalai.**

SECTION 4—ANALYSIS AND VALUATION OF THE CROP.

822. *Stockmapping.*—The areas proposed for inclusion in this working circle have been ocularly stockmapped under three categories, namely :—

(i) areas well stocked with bamboos;

(ii) areas partially stocked with bamboos; and

(iii) areas with a few scattered bamboos, or with no bamboos.

823. Generally areas falling under categories (i) and (ii) have alone been included within the working circle, excepting where inclusion of category (iii) areas has been found necessary for the purpose of obtaining convenient natural boundaries.

824. *Valuation of the crop.*—No detailed analysis of the crop was made as it was not called for.

SECTION 5—METHOD OF TREATMENT.

825. *Silvicultural System.*—The silvicultural system to be adopted may be defined as the ' Culm Selection System ' (S. Krishnaswamy and S.A. Shah, 1959).

826. *Felling Cycle.*—A felling cycle of three years is prescribed as in the past plan. This is the period generally adopted for working bamboos in the state.

827. *Regulation of the yield.*—The yield will be regulated by area. Each felling series is divided into three coupes, one coupe being worked every year. The coupes in each felling series have been constituted to some extent on the effective areas under bamboos in each coupe, but to a larger extent depending on the topographical features of the country over which the bamboos lie scattered. In the lay out of the annual coupe, natural features have been adopted.

SECTION 6—METHOD OF EXECUTING FELLINGS.

828. *Agency of exploitation.*—The fellings will be made through the agency of contractors by selling the coupes prescribed for the year in open auction as at present. There is however a strong case for working bamboos departmentally, as bamboo felling rules are followed only in the breach by contractors and no amount of fines imposed have been able to deter them. The suggestion requires to be given a fair trial in order to save the bamboo forests from progressive deterioration and ultimate extinction due to faulty working by contractors.

829. *Period of lease.*—The lease period will be one year for each coupe and will be concurrent with the fiscal year. Each annual coupe will form a separate lease unit.

830. *Felling Rules.*—The following felling rules are prescribed. :

(i) A minimum of 6 green mature culms should be left in each clump; a culm will be considered mature if it is at least one year old.

(ii) No culm which is less than a year old shall be felled.

(iii) No culm shall be removed with the rhizome.

(iv) Culms shall be cut clean and as low as possible, but not below the first internode from ground level.

(v) Felling shall be made on the side of the clump opposite to that from which the largest number of new culms spring up.

(vi) Bamboos in a fuel coupe under working will be the property of the fuel coupe contractor and not of the bamboo coupe contractor. They may be felled indiscriminately without any reservation as it is proposed to regenerate them.

(vii) Bamboos occurring in the teak conversion coupes of the year will not belong to either the top end contractor or the bamboo coupe contractor. They will be felled and left on the ground by the top end contractor as they are required for burning.

831. *Supply of bamboos to the paper mills at Pallipalayam.*—Seventy five per cent of the estimated yield in the bamboo coupes of Tunacadavu Range will be earmarked for supply to the Seshasayee Papers and Boards at Pallipalayam. The remaining 25 per cent will be utilised by the contractor for sale in the open market. The District Forest Officer may however at his discretion, restrict, suspend or increase the quantity of bamboos to be supplied to the paper mill from any coupe depending on the need. The bamboo coupes in Pollachi Range are not targetted for mill supply as they do not contain bamboos in sizeable quantities.

832. Of the bamboo coupes thus marked for supply to the mill, the contractor will be at liberty to supply any bamboo, green or dry, straight or crooked, so long as it has not developed any decay or fungal attack. The bamboos supplied should not be less than 2.5 centimetres in diameter at the thinner end and not less than 1.5 metres or more than 5.50 metres in length.

833. The contractor will arrange to transport the bamboos from the forest depots in the coupe to the mill site and effect delivery for which he will be paid at rates fixed by the District Forest Officer per air-dried tonne of bamboo for each coupe. These rates will be inclusive of charges for cutting, conversion, collection, transport to roadside, loading in lorries, transport to the mill site and unloading at the mill site. The paper mill will make all arrangements for the weighment of incoming loads at the mill site without any unreasonable hold up or delay. The air-dried weight of every consignment of bamboo delivered will be mutually agreed upon by a forest officer stationed at the mill site, the contractor's representative delivering the bamboos and the mill representative who acknowledges the delivery of the bamboos, based on actual data collected by the department for different grades of bamboos and the time lag involved between collection and delivery. In case of dispute, the matter will be referred to the Assistant Conservator of Forests, Bamboo Supplies, Erode, whose decision will be final.

834. Payments will be made to the contractor directly by the mill on the date of arrival for weights accepted by the mill. The company will pay to the department, royalty on the bamboos based on their air-dried weight at such rates as may be fixed by the State Government from time to time.

835. *Supply of local demand.*—The bamboo coupe contractor shall at all times during the period of his contract sell to ryots on demand for their bona fide and domestic agricultural purposes, bamboos at such rates as may be fixed by the District Forest Officer in consultation with the Collector from time to time.

836. The contractor shall also be bound to supply to the Basket makers' Co-operative Societies, their requirements of bamboos (not splits) at such rates to be worked out by the District Forest Officer and accepted by the Government after considering the cost of extraction, transport, seigniorage and handling charges.

SECTION 7—TABULAR STATEMENT OF FELLINGS.

837. The following statement gives details of the coupes to be worked annually during the next 10 years, in each of the felling series included in the Bamboo Working Circle. Coupes which are to be worked during the succeeding five years are also indicated, so that there may be no break in the continuity of controlled working in case the revision of the plan is not taken in time. The effective area noted against each coupe is only approximate. The probable yield of bamboos from each coupe is also noted. These figures which have been based on contractor's statements although not quite reliable, will serve as a guide to estimate the expected yield.

(a) POLLACHI RANGE.

Year of working. (1)	*Name and number of coupe.* (2)	*Area of the coupe in hectares.* *Gross.* (3)	*Area of the coupe in hectares.* *Effective.* (4)	*Compartments.* (5)	*Estimated yield.* (6) METRIC TONNES.	*Boundaries.* (7)
1965–66 1968–69 1971–72 1974–75 1977–78	**Ayerangal Bamboo Coupe I.**	212·94	180·00	**Sethumadai 6** ..	500	*North.*—The Dawson road. *East.*—Starting from a point where the Dawson road cuts the outer boundary of the Anamalai Reserved Forest, the boundary runs south-wards along the said reserve boundary to a point between cairn numbers 84 and 84 (*a*). *South.*—From the last said point, the boundary runs north-west and thence south-west up to the Pandaravaraimalai. *West.*—The inter-state boundary between Madras and Kerala from the Pandaravaraimalai to a point where the Dawson road enters the Madras State.
1966–67 1969–70 1972–73 1975–76 1978–79	Ayerangal Bamboo Coupe II.	310·63	200·00	**Sethumadai 7 and 8.**	400	*North.*—A ridge running north-east and thence south-east and connecting the Pandaravaraimalai to a point between cairn numbers 84 and 84 (*a*) along the outer boundary of the Anamalai Reserved Forest. *East.*—The boundary then follows south-wards and thence east-wards along the reserve boundary up to a point midway between cairn numbers 102 and 103 where the Sethumadai Canal cuts the reserve boundary. *South and West.*—The boundary then follows the Sethumadai Canal to a distance of about 25 chains up stream and thence runs upstream along a perennial stream rising from a point about 20 chains east of the Pandaravaraimalai to the said point.
1967–68 1970–71 1973–74 1976–77 1979–80	**Ayerangal Bamboo Coupe III.**	572·01	300·00	**Sethumadai 9 to 12.**	475	*North.*—Starting from a point about 20 chains east of the Pandaravaraimalai, the boundary follows the course of a stream running south-east until it meets the Sethumadai Canal; thence follows the Sethumadai Canal until it emerges out of the reserve boundary between cairn numbers 102 and 103. *East.*—From the last said point, the boundary runs southwards along the reserve boundary up to cairn number 111; it then follows the inner boundary of the Sarkarpathy Hill-tribe settlement up to cairn number 121; the boundary then runs south-wards again along the reserve boundary up to a point between cairn numbers 124 and 125 where the Aliyar Feeder Canal cuts the reserve boundary. *South.*—From the last said point, the boundary runs along the Aliyar Feeder Canal up to the Sarkarpathy Regulator and thence upstream along the Vagiriar river up to the common boundary between Pollachi and Tunacadavu Ranges. *West.*—The boundary then follows the common boundary between Pollachi and Tunacadavu Ranges up to the starting point.

(6) TUNACADAVU RANGE

Year of working.	*Name and number of coupe.*	*Area of the coupe in hectares.*		*Compartments.*	*Estimated yield.*	*Boundaries.*
		Gross.	*Effective.*			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
					METRIC TONNES.	
1965–66 1968–69 1971–72 1974–75 1977–78	Pachathanni Bamboo Coupe I.	594·96	500·00	Upper 1 and 2.	225	*North.*—The course of the Vagiriar river from a point where it cuts the common boundary between Pollachi and Tunacadavu Ranges up to the Sarkarpathy Regulator; thence along the Aliyar Feeder Canal up to a point midway between cairn numbers 124 and 125 where the said canal emerges out the outer boundary of the Anamalai Reserved Forest; thence along the said reserve boundary up to cairn number 151. *East.*—From the last said point, the boundary runs upstream along the course of a river arising from a peak marked on the map as 4,280′ app. along the common boundary between Pollachi and Tunacadavu Ranges up to the said peak. *South and west.*—The boundary then runs along the common boundary between Pollachi and Tunacadavu Ranges up to the starting point.
1966–67 1969–70 1972–73 1975–76 1978–79	Pachathanai Bamboo Coupe II.	753·02	652·00	Upper 3 to 5.	500	*North.*—The outer boundary of the Anamalai Reserved Forest from cairn number 151 up to cairn number 173. *East.*—From cairn number 173 on the outer boundary of the Anamalai Reserved Forest, the boundary runs south-east along a ridge up to a peak marked on the map as Δ 4,529′; thence south-wards along the common boundary between the Anamalai Reserved Forest and the Thalanai Estate up to the common boundary between Pollachi and Tunacadavu Ranges. *South.*—The boundary then runs along the common boundary between Pollachi and Tunacadavu Ranges up to a peak marked on the map as 4,280′ app. *West.*—The course of a stream starting from a peak marked on the map as 4,280′ app. on the common boundary between Pollachi and Tunacadavu Ranges until the said stream crosses the outer boundary of the Anamalai Reserved Forest.
1937–68 1970–71 1973–74 1976–77 1979–80	Pachathanni Bamboo Coupe III	800·69	710·00	Upper 6 to 8	390	*North.*—The outer boundary of the Anamalai Reserved Forest from cairn number 173 up to a point midway between cairn numbers 221 (*a*) and 222. *East.*—From the above said point, the boundary follows a prominent ridge running in a south-west direction to the common boundary between Pollachi and Punachi Ranges.

						South.—The boundary then follows the common boundary between Pollachi and Punachi Ranges up to the Nadumalai, thence runs north-west and again south-wards along the common boundary between the Anamalai Reserved Forest and the Thalanar Estate up to a peak marked on the map as Δ 4,529'. *West.*—A ridge running northwards from a peak marked on the map as Δ 4,529' to cairn number 173 on the outer boundary of the Anamalai Reserved Forest.
1965-66 1968-69 1971-72 1974-75 1977-78	Topslip Bamboo Coupe I.	852·73	650·00	Mount Stuart 52, 53, 74 to 76 and 80	1,900	*North.*—Starting from a point where the Tunacadavu river enters the Kerala State, the boundary runs upstream along the said river to its point of origin on a peak marked as 4,433' app. on the management map. *East and South.*—From the above mentioned peak, the boundary runs south and south-west along the Umayamalai-Vellimalai ridge up to Vengolimalai. *West.*—Thence along the inter-state boundary between Madras and Kerala up to the starting point.
1966-67 1969-70 1972-73 1975-76 1978-79	Topslip Bamboo Coupe II.	1,025·21	714·00	Mount Stuart 65, 66, 68, 69, 70 to 73 and 77 to 79.	725	*North and East.*—Starting from a point where the Parambikulam-Sethumadai road enters the Madras State, the boundary runs north-east along the said road up to Topslip Tanah, thence along a tributary of the Vagiriar river until it meets the common boundary between Tunacadavu and Pollachi Ranges, thence south and south-east along the said common boundary to a peak marked as 4,433' app. on the management map. *South.*—The Tunacadavu river from its point of origin on a peak marked as 4,433' app. on the management map until it enters the Kerala State. *West.*—The boundary then follows the inter-state boundary between Madras and Kerala up to the starting point.
1967-68 1970-71 1973-74 1976-77 1979-80	Topslip Bamboo Coupe III.	721·73	440·00	Mount Stuart 58 to 64, and 67.	1,525	*North and East.*—Starting from the Pandaravaraimalai at the trijunction of the Kerala State with the Pollachi and Tunacadavu Ranges, the boundary then runs east and south-east along the common boundary between Pollachi and Tunacadavu Ranges until it meets a tributary of the Vagiriar river. *South.*—The boundary then runs upstream along the course of the said tributary until it meets the Topslip Tanah on the Sethumadai-Parambikulam road; thence south-west along the said road up to the inter-State boundary between Madras and Kerala. *West.*—The boundary then runs north-wards along the inter-state boundary between Madras and Kerala up to the starting point.

(b) TUNACADAVU RANGE—*cont.*

Year of working.	*Name and number of coupe.*	*Area of the coupe in hectares.*		*Compartments.*	*Estimated yield.*	*Boundaries.*
		Gross.	*Effective.*			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1967—68 1970—71 1973—74 1976—77 1979—80	Ulandi Bamboo Coupe I.	2,216·06	1,604·00	Ulandi 81 to 90.	2,603	***North.***—Starting from Vengolimalai, the boundary runs eastwards along the ridge connecting Anaigundi saddle, Vellimalai and Umayamalai. ***East and South.***—From Umayamalai, the boundary runs southwards along the eastern boundary of Ulandi 83 to meet the Varagaliar river; the boundary then runs upstream along the course of the Varagaliar to a distance of about 40 chains to a point marked as 3,003' app. on the management map, the boundary then runs south and west along the Olaivaraimalai, Mavalakundru, Nadumalai, Palakadavumalai ridge until it meets the inter-state boundary between Madras and Kerala. ***West.***—The inter-state boundary between Madras and Kerala up to the starting point.
1965—66 1968—69 1971—72 1974—75 1977—78	Ulandi Bamboo Coupe II.	1,507·13	1,352.08	Palakadavu 91 to 105.	2,185	*North.*—Starting from the inter-state boundary between Madras and Kerala, the boundary runs along the Palakadavumalai 59, Nadumalai, Mavalakundru, Olaivaraimalai ridge up to a point on the Varagaliar river marked as 3,008' app. on the management map. ***East.***—From the above mentioned point, the boundary runs south east and south along the common boundary between Palakadavu and Perumkundru blocks until it reaches the Panattiar; thence along the course of the said river up to a point marked as 2,095' app. on the management map; thence north-east along the course of a perennial stream arising from a peak marked as △ 3,222' on the management map up to the said peak; thence. south-west along a ridge up to peak marked as 2,930' app. on the management map; thence south-west along a stream arising from the same peak until it meets the Parayankadavu river. *South and West.*—From the above mentioned point, the boundary runs along the course of the Parayankadavu and Periyar rivers up to the inter-state boundary to the starting point.
1966—67 1969—70 1972—73 1975—76 1978—79	Ulandi Bamboo Coupe III.	2,212·48	1,872·00	Palakadavu 96 to 104	3,025	*North* :—Starting from a point where the Periyar river enters the Kerala State, the boundary runs upstream along the course of the said river and its tributary the Parayankadavu River until it meets the common boundary between Palakadavu and Parayankadavu Blocks.

East :—From the above-mentioned point, the boundary runs along the common boundary between Palakadavu and Parayankadavu Blocks until it meets the common boundary between the Anamalai Reserve Forest and the Urulikal Estate.

South :—The boundary then runs south-west along the common boundary between the Anamalai Reserve Forest and the Urulikal estate until it meets the trijunction point between the Anamalai and Tunacadavu Reserves and the Urulikal Estate; thence runs west wards along the common boundary between the Tunacadavu Reserve Forest and the Urulikal and Sheikalmudi estates until it meets the inter-state boundary between Madras and Kerala.

West :—The inter-state boundary between Madras and Kerala from the North-western corner of the Sheikalmudi estate up to the starting point.

SECTION 8—OTHER REGULATIONS.

838. *Grazing* :—The forests included in this working circle will be open to grazing at all times.

839. *Fire protection* :—The working circle will be protected from fire under the prescriptions for general fire protection as detailed in the chapter on Miscellaneos Regulations.

SECTION 9—CONTROL.

840. *Control* :—A control book, control journal, record of works and register of deviations will be maintained for this working circle. The manner in which these forms are to be maintained are indicated in sections 22 and 23 under the Chapter on Miscellaneous Regulations.

841. Special mention should be made in the control journal when any sporadic or general flowering of bamboo is noticed in any particular locality or localities in the region.

CHAPTER IX--WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE.

842. The Minor Forest Produce Working Circle will cover all the forests under the control of the Forest Department in the Coimbatore South Division. The prescriptions framed herein will apply 'to the farming of all minor forest produce occurring within the working circle with the exception of bamboos which have been dealt with separately.

SECTION 2—ANALYSIS AND VALUATION OF THE CROP.

843. The important items of minor forest procedure occurring in the division are :—

English or Tamil name (1)	*Botanical name of species* (2)	*Portions used,* (3)
Athikai	*Ficus* species	Fruits
Avaram bark	*Cassia auriculata*	Bark
Bees wax	..	..
Black dammer or *Karunkungiliam*	*Canarium strictum*	Gum
Cardamom	*Elettaria cardamomum*	Fruits
Clearing Nut or *Thethankottai.*	*Strychnos potatorum*	Seeds.
Curry leaves	*Murraya koenigii*	Leaves.
Cut stone.	..	..
Deer horns,	..	..
Eacham grass	*Phoenix acaulis*	Leaves.
Eiya kundu	*Rouwolfia serpentina*	Roots,
Elandai	*Zizyphus mauratiana*	Fruits..
Fodder grass	Several species	Entire plant.
Gall nut	*Terminalia chebula*	Fruits.
Gravel	..	..
Ginger	*Zingiber officinale*	Stem tuber.
Gum kino	*Pterocarpus marsupium*	Gum
Honey	..	..
Indukodi	*Acacia intsia*	Bark
Indunar	*Acacia intsia*	Fibre
Ivory	..	..
Kalli	*Euphorbia antiquorum*	Stem.
Kattu mandarai	*Bauhinia vahlii*	Leaves.
Kana-kamugu	*Pinanga dicksoni*	Fruits and leaves
Kattu Jathikai	*Knema attenuata*	Fruits,
Kilakkai	*Carrisa carandas*	Fruits.
Konnai bark	*Cassia fistula*	Bark.
Kundumani	*Abrus precatorius*	Seeds.
Koovai	*Curcuma angustifolia*	Leaves.
Korai grass	*Cyperus rotundus*	Stem.
Lavangam	*Cinnamomum zeylanicum*	Bark.
Lemon grass	*Cymbopogon* species	Leaves and stem.
Mahali kilangu	*Gymnema montanum*	Root tuber
Mohwa	*Madhuca indica*	Flowers and seeds.
Nannariver	*Hemidesmus indicus*	Roots.
Neem seeds	*Azadirachta indica*	Seeds.
Nellikai	*Emblica officinalis*	Fruits.
Nux Vomica	*Strychnos nux-vomica*	Seeds.
Odankodi	*Hippocratea indica*	Stem.
Peypodal	*Trichosanthes cucumerina*	Fruits.
Plantain leaves	*Musa* species	Leaves.
Pungam seeds.	*Pongamia pinnata*	Seeds.
Rattan	*Calamus* species	..
Sambhur horns	..	..
Soap nut	*Sapindus emarginatus*	Fruits.
Sheboy	*Acacia concinna*	Fruits
Stone	..	..
Tamarind	*Tamarindus indica*	Fruits
Thlukai	*Entada phaseoloides*	Seeds
Teeanika or Beleric myrobolam	*Terminalia belerica*	Fruits
Turmeric	*Curcuma longa*	Stem tuber
Vmbadami	*Ventilago madraspatana*	Bark
White dammer or *Vellakungiliam*	*Vateria indica*	Gum
Wild Brinjal	*Solanum nigrans* and *Solanum pubescens*	Fruits.
Wild Jack	*Artocarpus heterophyllus*	Fruits
Wild Mangoes	*Mangifera indica*	Fruits
Wild pepper	*Piper longum*	Fruits
Woo dapple	*Feronia limonia*	Fruits

SECTION 3—DIVISION OF THE AREA

844. As in the previous plan, in dividing the area into farms, each range will be considered as a unit of sale, except in the case of the Udumalpet Range which will be split into two units, since the Dharapuram forests are quite separated from the rest of the forests in the range. Wherever a particular produce exists in sufficient quantities, or has been specially developed over limited areas (e.g., Cardomom in worked sleeper coupes, *Ocimum kilimandscharicum*, *Rouwolfia serpentina*, etc.,), or where the produce involved (e.g. Avaram bark, gallnuts, lemongrass, etc.,) invites bidders who are not ordinarily interested in other items of minor forest produce, they are put up for sale separately. The units of sale are noted in the statement below.:—

Units of sale. (1)	Nature of produce. (2)	Area covered by the lease. (3)	Remarks.
		(a) POLLACHI RANGE.	
1.	All minor forest produce except gallnuts, lemon grass, *Konnai* bark, *Avaram* bark, stone, gravel, ivory, sambhur and deer horns.	Reserved Forests of Pollachi Range excepting Sarkarpathi settlement and areas leased to other Government Departments.	
2	Gallnuts	Do.	
3.	Lemon grass	Do.	
4.	*Avaram* bark	Do.	
5.	*Konnai* bark	Do.	
		(b) TUNACADAVU RANGE.	
1.	All minor forest produce except the following.—	Reserved forests of Tunacadavu Range excepting hill-tribe settlements and areas leased to other Government Departments.	
(i)	Canes		
(ii)	Cardamom in the departmentally tended gaps of worked sleeper coupes in Palakadavu 101, 102 and 104 and Parayankadavu 2.		
(iii)	Specially developed items such as *Rauwolfia serpentina* and *Ocimum kilimandscharicum*.		
(iv)	Ivory		
(v)	Sambhur and deer horns		
(vi)	Stone		
(vii)	Gravel		
2.	Cardamom	Occurring in the departmentally tended gaps of worked sleeper coupes in Palakadavu 101, 102 and 104 and Parayankadavu 2.	
		(c) PUNACHI RANGE.	
1.	All minor forest produce except lemon grass, canes, reeds, cardamom, *Konnai* bark, stone, gravel, ivory, sambhur and deer horns.	Reserved forests of Punachi Range excepting hill-tribe settlements and areas leased to other Government Departments.	
2.	Gallnuts	Do.	
3.	Cardamom	Do.	
4.	Reeds	Reserved forests of Punachi Range excepting hill-tribe settlements and areas leased to other Government Departments.	
5.	Lemon grass	Do.	
6.	*Konnai* bark	Do.	
7.	Canes	Do.	

Units of sale. (1)	*Nature of produce.* (2)	*Area covered by the lease.* (3)
	(d) UDUMALPET RANGE.	
1.	All minor forest produce except gallnuts, lemon grass, canes, *Konnai* bark, *avaram* bark, stone, gravel, ivory, sambhur and deer horns.	Reserved forests of Udumalpet Range excepting hill-tribe settlements and areas leased to other Government departments.
2.	Gall nuts	Reserved Forests of Udumalpet Range excepting hill tribe settlements and areas leased to other Government departments.
3.	*Kalli*	Do.
4.	Lemon grass	Do.
5.	*Avaram* bark	Reserved Forests of Udumalpet Range barring hill-tribe settlements, areas leased to other Government departments and ex-panchayat forests in Dharapuram Taluk.
6.	*Avaram* bark	Ex-panchayat forests in Dharapuram taluk.
7.	*Konnai* bark	Reserved forests of Udumalpet Range barring hill-tribe settlements and areas leased to other Government departments.
8.	Canes	Do.

SECTION 4—METHOD OF TREATMENT.

845. *Agency of exploitation.*—Item 1 under Tunacadavu Range and items 1 and 4 under Punachi Range will continue to be leased to the Hill Tribes' Co-operative Societies formed in these two ranges under the terms laid down in G.O. Ms. No. 3233, Development, dated 11th July 1953. All the other minor forest produce units noted under paragraph 844 will be exploited through the agency of contractors. The right to collect the produce will be leased out by sale in open auction.

846. Ivory, deer and sambhur horns and the valuable remains of dead animals will be collected departmentally in the interests of preservation of wild life, because contractors may not necessarily confine their collection to horns found fallen on the forest floor. Items such as Camphor Tulsi (*Ocimum kilimandsharicum*) and *Rouwolfia serpentina* specially developed over limited areas in the Tunacadavu Range will be also collected and sold departmentally as the economics of raising these species will have to be worked out. Further, the demand for these produce will be also selective and a market has to be established giving no room for adulteration.

847. Stone and gravel will be sold on demand at seigniorage rates to the desirous public from the existing quarries within the reserves. The following are the seigniorage rates approved by the Government for such removals as per the [illegible]

Name of produce.	*Rate.*
	RS. P.
Rough stone	2.50 per unit of 2.83 cubic metres.
Chiselled stone	5.00 per unit of 2.83 cubic metres.
Metal and gravel	1.00 per unit of 2.83 cubic metres.
Earth and turf	0.62 per unit of 2.83 cubic metres.
Sand fit for mortar	2.50 per unit of 2.83 cubic metres.
Sand fit only for filling trenches	1.50 per unit of 2.83 cubic metres.

848. In case of demand, fresh quarries may be opened by the District Forest Officer in such places where there is no growth, so that no detriment is caused to the forests. It is however prescribed that the area of the quarry site should be demarcated on the ground and specified on the permit issued by the District Forest Officer in order to prevent quarrying all over the place.

849. *Period of lease.*—All minor forest produce sale units except canes, gallnuts, *avaram* bark and *Konnai* bark will be leased out annually for the fasli year from 1st July to 30th June.

850. In respect of gallnuts, the existing period of lease is for two years. This will be continued.

851. In the case of *Avaram* bark, the lease period will be the financial year from 1st April to 31st March.

852. *Konnai* bark occurring in the reserve of Pollachi, Punachi and Udumalpet Ranges will be exploited in each range on a three-year felling cycle as detailed below :—

Name of range. (1)	*Year of working.* (2)
Udumalpet Range	1965–66 1968–69 1971–72 1974–75 1977–78
Pollachi Range	1966–67 1969–70 1972–73 1975–76 1978–79
Punachi Range	1967–68 1970–71 1973–74 1976–77 1979–80

853. In respect of canes, the *voidah* will be for one year but the right to cut and collect them will be sold once in five years in order to allow the species to recover—vide Chief Conservator's No. Rt. 304/59, dated 6th March 1959. The felling cycle for canes is detailed below :—

NOTE :—Canes in Tunacadavu Range were last worked during 1957–58. In the Punachi and Udumalpet Ranges, they were last worked during 1963–64.

Name of range. (1)	*Year of working.* (2)
Tunacadavu Range	1965–66 1971–72 1977–78
Punachi Range	1968–69 1974–75
Udumalpet Range	1968–69 1974–75

854. *Auction sales.*—Auction sales will be held between the 15th of May and the 15th of June for all items of minor forest produce except *Avaram* bark. In the case of *Avaram bark*, the auction will be held between the 15th of February and the 15th of March. In case the prices obtained at the sales are not satisfactory, it is suggested that tenders may be called for by the District Forest Officer.

855. *Processing of camphor and camphor oil.*—Mention has been already made in the chapter on Teak Plantation Working Circle about the details of *Ocimum kilimandscharicum* cultivation in the younger teak plantations of Tunacadavu Range. The collection of leaves and distillation of camphor and camphor oil will be undertaken departmentally, as this is a new industry which is yet to receive sufficient publicity.

856. The leaves of the plant contain the essential oil. Harvest will be made when the plants are about to flower. Three crops of leaves can be obtained in a year. The plants will be cut by means of a sickle about a foot above ground for the first harvest and the herbage dried in shade. The plants will be cut a little higher in the second and subsequent harvests. The plants will continue to yield herbage for about 4 years, but

since the teak canopy is bound to close much earlier, collection of leaves beyond a period of 3 years may not be possible. The crops will be stored in a dry place, protected from rain and wind. The leaves will be separated from the stems as the latter are said to be practically devoid of camphor and oil. The stems can be used as fuel. It is preferable to distil dry leaves, as fresh leaves yield comparatively less distillate and are also uneconomical to handle owing to a large bulk requiring more fuel and time for distillation. (R.L. Bhadwar, G. V. Karira and S. Ramaswami, 1959).

857. A field distillation still will be made locally with reference to the scale drawings and description in Indian Forest Bulletin No. 210 and installed at Varagaliar, where there is perennial water supply. It is estimated to cost Rs. 225 excluding overhead charges.

858. *Distillation*.—The still will be directly heated over an ordinary fire place provided with a chimney about 2 metres high. On heating, camphor sublimes in the condenser. This will be scraped off and filtered through a filter bag or a centrifuge. The oil after separation from the water will be congealed by keeping overnight, when it throws down some more of the dissolved camphor, which also will be similarly filtered and dried. The distillation usually takes about 2 hours for each charge of about 25 kilograms of air-dry herbage of *Ocimum kilimandscharicum*.

859. The twin products of distillation, camphor and camphor oil will be sent to the Forest Utilisation Officer, Madras who will pack them in suitable containers for sale. There will be no difficulty in marketing camphor owing to keen demand in our temples and Hindu households for religious purposes.

SECTION 5—REGULATION OF REGENERATION OPERATIONS.

860. *Cultivation of Rouwolfia serpentina*.—In recent years, keen interest has been focussed on *Rouwolfia serpentina* owing to its remarkable drug potentialities. The species was known from centuries ago to herbalists in India who brew a calming tea from its root. The plant first came to the forefront, when Ciba scientists extracted Reserpine from its roots five hundred tunes as potent as the herbalists tea with properties to calm, screaming maniacal psychotics. Then another remarkable attribute of Reserpine, marketed by Ciba as Serpasil, became apparent. It lowered high-blood pressure, swiftly and dramatically from lethal levels to near normal.

861. India has a world monopoly over this species as it is indigenous to this country. Natural supplies of *Rouwolfia serpentina* have been almost exhausted due to large scale and indiscriminate collection of roots without attempts to regenerate the species. It is therefore imperative to grow this species or a small scale in suitable localities in order to cater to this life saving industry, while at the same time enabling the country to earn valuable foreign exchange.

862. *Rouwolfia serpentina* is a species occurring naturally in the moist deciduous type of forests and Tunacadavu Range appears to be the only suitable region for its propagation in this division. Analysis of soil samples from different parts of the country where the species grows in a natural state show, 'that this species prefers clay or clayey-loam possessed of a large percentage of humus and other organic debris which ensure uniform moisture levels and a soil pH ranging from 4.0 to 6.3 (P.D. Varadarajan, 1963)'. A suitable plot of 1 to 2 hectares in an open situation or with scattered trees on a gentle slope with good drainage will be selected. There is already a small plot of *Rouwolfia serpentia* at Topslip which will be maintained. Extension of *Rouwolfia* cultivation to two other locations, e.g., Anaigundi and Varagaliar where subordinates and hill-tribes are located is suggested.

863. *Planting technique*—(*a*) *Nursery*.—Nursery beds 12 metres by 1 metre by 4.3 metres will be prepared just as for teak and *Rouwolfia* seeds sown in dribbles 10 centimetres apart. The seeds have a low germination percentage and take 15 to 20 days to germinate. The species can be raised from root or stem cuttings also, but root production in plants raised by vegetative means is said to be strikingly low. Hence it is

necessary to propagate only from seed; but stock raised by vegetative means can be used as a seed source. The beds will be watered daily by means of a fine rose on all non-rainy days and shaded with a *pandal* for the hot months.

(b) *Transplanting.*—The plants will be transplanted to fresh beds in June with the onset of the south-west monsoon at an espacement of .6 metre by .3 metre. They will then be 10 to 15 centimetres in height. With the cessation of the monsoons, the plants will be watered as in the nursery. A pandal for shade will be also necessary after January. This should be, however, removed with the onset of the rains, as the plants suffer due to drip. The plants will be weeded and the soil worked thrice in a year—the first in July, the second in September and the third in January.

864. *Method of treatment.*—The plants will be grown on a 3-year rotation at the end of which the roots will be dug up and collected and fresh planting done. The roots may be so served as to leave a little bit of it in the plant, so that the latter could be replanted as to serve as a source of seed supply. *Rouwolfia* seeds are difficult to procure and the germination per cent of the seeds being also low, a good seed supply is essential.

865. The roots after collection will be air-dried under shade, packed in containers and sent to the Forest Utilisation Officer, Madras, for sale. The present demand for *Rouwolfia serpentina* in the pharmaceutical industry is bound to increase as chances of a suitable substitute being developed in the recent future are remote. There will be therefore no difficulty in marketing the roots, provided standards are maintained.

866. *Suggestions for improvement.*—Application of root hormones such as Seradir may be tried in consultation with the State Silviculturist in order to induce greater root formation. Periodical analysis of root samples from each locality for determining the percentage of alkaloid may be also done in collaboration with some of the pharmaceutical industries and seed collection for future collection restricted to plants of higher alkaloid content in order to improve yields.

867. *Planting of Tamarind in fuel coupes.*—Prescriptions have already been made under the chapter on Fuel Working Circle to plant Tamarind along with other fuel species while regenerating felled fuel coupes. Apart from yielding an excellent fuel-wood, the fruit of this species forms an important ingredient in the Indian culinary art. The present demand for Tamarind fruit will continue and is bound to increase steadily year after year since our eating habits are not likely to change. The fruit is presently in short supply owing to indiscriminate felling of trees in private lands. Efforts should be therefore made to plant a good percentage of Tamarind in all fuelwood plantations. This is perhaps the only way of increasing the proportion of this valuable species in areas earmarked for fuel working also.

868. *Tamarind farms.*—In addition, Tamarind farms over an area of 4 hectares will be raised annually in the Udumalpet Range in suitable areas outside the Fuel Working Circle limits. The espacement adopted will be wide, viz., 9 metres, as our objective will be to allow maximum crown expansion for stimulation of fruit production, unlike in a fuel plantation where the production of the maximum quantity of wood is the chief criterion. The area may be given for *kumri* cultivation if there is local demand as this will be to the advantage of the tree crop. These farms will be primarily maintained for fruit production and managed on a physical rotation. The trees will be felled only when they cease to bear.

869. The vacant spaces in the Forest colonies at Anamalai Farm, Sethumadai, Pasalmanthorai and Karattur and the rest house at Amaravathi may also be planted with Tamarind roughly at an espacement of 9 metres by 9 metres. Here too, the intervening space between the plants may be given for *kumri* cultivation, even free, if there is any local demand. Most of our forest colonies and rest houses outside the reserves are situated close to the villages. They do not have compound walls and stray cattle are a nuisance. *Kumri* in such areas apart from conferring the usual benefits of free soil-working and weeding to the plants, will also help in protecting them from

browsing, since the *kumridar* is bound to raise a brush wood or live fence around and also lay vigil to protect his agricultural crop. In either case, *kumri* will be allowed for the second year also if there is a demand, as this will be beneficial to the plantations.

870. *Planting technique.*—Container plants of tamarind about 1-2 years old will be planted during the south-west monsoon rains in .3 metre cube pits, dug and kept ready at the espacement reefrred to above. The plants will be weeder regularly. In case it is not possible to provide *kumri* cultivation, soil working to a depth of 10 to 15 centimetres around the plants will be got done departmentally twice during the first year of planting. The weedings and soil working should be repeated during the second year also. Casualties if any will be replaced during the second year.

871. The details of nursery technique will be the same as prescribed for fuel species under the chapter on Fuel Working Circle.

SECTION 6.—OTHER REGULATIONS.

872. *Supply of fuel to lemon grass stills.*—Distillation of lemon grass is done by the lessee within the reserved forest as the storage and transport of the grass over long distances outside the forest is uneconomic. In Shetty's plan, a prescription was made to allow the lessee to fell trees in areas where the grass occurs, and a fee of 6 naye paise was charged towards fuel on each ounce of oil distilled. The suggestion did not work properly as it is not practicable nor possible for the subordinates to watch the movements of the lessee all the time. It is therefore prescribed that an amount of 5 naye paise in a rupee on the sale amount tendered by the lessee for this unit may be collected towards the entire quantity of wood that might be used in the process of distillation, subject to the condition that only dead wood is used. It is not desirable to permit felling of green trees and set further retrogression in a forest already tending towards the Savannah type.

873. *Staff.*—A staff of one Forest Guard will be necessary to look after the distillation of *Ocimum* leaves in Tunacadavu Range. For the other items of work proposed in this working circle, no special staff is considered necessary.

SECTION 7.— CONTROL.

874. A control book, control journal, record of works, register of deviations and plantation and nursery journals will be maintained for this working circle. The manner in which these forms are to be maintained are detailed in sections 22 and 23 under the chapter on Miscellaneous Regulations.

CHAPTER X—MISCELLANEOUS REGULATIONS.

875. There are a number of prescriptions on mostly minor subjects which do not merit the formation of separate working circles. These are detailed in this chapter.

SECTION 1—GRAZING.

876. The areas closed to grazing will fall under the following categories, namely :—

(i) Areas permanently closed to grazing.

(*ii*) Areas closed for specified periods under the provisions of this plan.

(iii) Areas temporarily closed to grazing as a punitive measure under the provisions contained in the Madras Forest Manual, for cases of unauthorised and wanton burning.

877. *Permanent closure.*—The following areas in the division will be permanently closed to general grazing :—

(i) The whole of the Tunacadavu Range—*vide* C.C.P. Mis. No. 434, dated 9th September, 1933.

(*ii*) The Punachi Range, except the Thorakadavu Block, Punachi 1 and 2 and an extent of 1,181.69 hectares as shown—*vide* C.C.P. Mis. No. 58, dated 5th February, 1937.

		Area in hectares
(a)	Ibex hill (Part of Vannanthorai 7 and Waterfall 3,6)	315·5
(b)	Koramparai (Part of Iyerpadi 4 and Akkamalai 9, 10)	595·5
(c)	Between Chinnathalanarmalai and Kavarkalmalai adjoining Mount Stuart Estate on the south-east.	272·0

(iii) Kukkal and Kudrayar Blocks in the Udumalpet Range—*vide* D. Dis. No. 563/36, dated 3rd July 1936.

(*iv*) The Manjampatti, Tenar and Pambar Blocks will be also closed to grazing as it is proposed to constitute this area as a sanctuary for gaur.

878. *Closure for specified periods under the provisions of this plan.*—The following areas will be temporarily closed to grazing.

(*i*) All coupes of the Fuel, Eucalyptus Hybrid and Irrigated Teak Plantation Working Circles will be closed to grazing for a period of 5 years including the year of coupe working.

(*ii*) All plantations raised under the prescriptions of the Rehabilitation Working Circle and the Minor Forest Produce Working Circle will be closed for a period of 5 years including the year of formation.

(*iii*) All areas where experiments or research are conducted will be completely closed to grazing for certain specified periods as may be fixed by the Silviculturist or the District Forest Officer from time to time.

879. *Closure as a punitive measure.*—Areas damaged by fire or other causes will be closed to grazing for a specified period by a special order in each case, with a view to its recovery, subject to the condition that the aggregate of the area so closed at a time does not exceed 200 hectares in one particular locality and that the District Forest Officer submits a report to that effect to the Collector and to the Chief Conservator of Forests, through the Conservator of Forests *vide* G.O Mis. No. 51, Development, dated 4th January, 1940.

880. *Grazing concessions.*—Although the Tunacadavu Range is closed for general grazing, grazing of catle belonging to the subordinates and local labour is permitted for their bonafide domestic use. The number is restricted to one cow or she buffaloe (excluding calves up to one year old) on the average for each subordinate or member of the local labour force. A maximum of 60 heads of cattle is fixed for which free grazing permits will be issued by the Range Officer—Vide C.C.P. No. 920/62, dated 3rd June. 1962.

881. With the establishment of the Parambikulam-Aliyar Project colony at Top slip, there has been a great increase in the cattle population of Tunacadavu Range. It is therefore necessary to regulate the grazing and restrict the number to only bonafide users and stern steps taken to prevent the regular business of milk in the region, as this will be harmful to the interests of the forests. Cattle owned by the staff of the Parambikulam-Aliyar Project and the Manamboli Estate will be allowed as a special case to graze in the Tunacadavu Range in areas other than plantations on payment of the usual grazing fees, subject to the condition that not more than one cow or she buffaloe will be maintained by each member. Coffee hotel owners and milk vendors will be strictly not allowed to graze their cattle in the range as per the instructions in Chief Conservator's Proceedings No. 920/62, dated 3rd June, 1962.

882. Punachi 1 and 2 are now open to grazing as a special case for cattle belonging to the residents of of Attakatti at an uniform grazing fee of Rs. 0.25 per cow unit but limited to a maximum of 100 cow units. Wih the recent establishment of the Electricity Board campus at Attakatti for the execution of the Upper Aliyar Dam, there is a sudden increase in the population at Attakatti. The limit of 100 cow units fixed a couple of

decades ago will therefore not suffice. It is therefore suggested that the upper limit be raised to 200, and each member of the Electricity Board or local resident allowed to graze one cow or she buffaloe (calves below one year old being excluded) in areas other than plantations subject to payment of the usual grazing fees just as in the Tunacadavu Range. Coffee hotel owners and milk vendors will be strictly not allowed to graze their cattle here also.

883. *Regulation of grazing fees.*—Grazing will be regulated by the issue of permits printed in accordance with the provisions contained in the Madras Forest Manual. The following domestic animals may be licensed to graze, the existing fees being levied for all the areas in the division.

Description of animals.	*Rate per head.* RS. P.
Sheep	0.12 per year.
Cows, bulls, asses and horses	0.25 per year.
Buffaloes	0.50 per year.
Elephants	1.00 per month.

884. Calves aged below 6 months and accompanying its mother, but not driven independently will be allowed to graze free. Calves admitted at the beginning of the year as being 6 months old should pay half rates for the second half of the year beginning from the 1st of January.

885. Goats will on no account be licensed to browse or admitted into any of the reserves.

886. *Grazing unit.*—The whole of the Coimbatore South Forest Division will form one grazing unit. A grazing permit issued by any of the Range Officers will be therefore valid throughout the division.

887. *Grazing year.*—A grazing permit issued will be valid for only one grazing year—the *fasli* year from 1st July to 30th June.

888. *Fodder grass.*— The item will continue to be leased out for commercial purposes along with other minor forest produce. However cutting and removal of grass in head-loads free of cost by the public for bonafide domestic purposes, and by co-operative milk supply unions and societies for the manufacture of silage, will be permitted from the reserved forests except from areas closed to grazing. This concession was originally sanctioned in G.O. Mis. No. 227, Development, dated 26th January, 1936, in accordance with the recommendations of the Royal Commission on Agriculture in 1929, and modified from time to time. The removal of fodder grass free from the reserved forests will be under the following conditions :—

(*i*) Removals will be allowed only in head-loads for bonafide use and for use of co-operative milk supply unions and societies. Removals in cart-loads will not be permitted.

(*ii*) Removals may be made throughout the year, but they shall not be made before dawn or dusk.

(*iii*) No permits will be required. It is considered that the introduction of permits may result in malafide practice by the subordinates.

(*iv*) Only long grass shall be cut; it shall not be uprooted. Only sickles shall be used. Bill hooks and felling axes shall not be carried.

(*v*) No forest produce shall be cut to stiffen or tie the bundles.

(*vi*) Removals shall be made only through recognised foot-paths or roads which will be notified in the District Gazette.

(*vii*) The head-loads of grass should be presented for inspection when demanded by a Forest Officer.

(viii) The grass shall not be set fire to, either wilfully or negligently and no combustible material should be taken into the forest; if fire breaks out, the grass-cutters shall make every endeavour to extinguish it.

(ix) The concession is liable to be withdrawn for serious breach of any of the conditions mentioned above or in the event of the occurrence of any serious fire, under the orders of the District Forest Officer, who shall report the fact to the Collector for approval within ten days.

889. *Penning.*—Penning cattle within the forests open to grazing will be allowed between 1st of July and the 31st of December. No fees will be charged for penning. Parties desirous of utilising a particular pen will obtain a penning licence which will be issued by the Range Officer.

890. A list of cattle pens now in use in the division is given in pagges 225 and 224. included therein may be opened by the District Forest Officer, if he considers it necessary, but these shall be outside the limits of the Fuel, *Eucalyptus* hybrid and Irrigated Teak Plantation Working Circles.

891. *Rotational or deferred grazing.*—No schemes for rotational or deferred grazing are prescribed as their practical application has proved to be a failure all over the State.

892. *Grazing notification.*—A notification will be published in the District Gazette every year in the month of May specifying the areas closed to grazing, and the conditions under which free removal of fodder grass will be permitted in the different parts of the division.

893. *Demarcation of closed areas.*—All areas closed to grazing will be marked on the ground by means of red sign boards written in Tamil and in English at as many salient points as may be necessary.

894. *Control.*—A control book, control journal and control maps will be maintained by the District Forest Officer in the manner prescribed in sections 22 and 23 of this chapter and posted before the close of each financial year. The control maps should clearly show the penning sites commonly used.

Serial number. (1)	Name of pen. (2)	Compartment. (3)	Name of water source. (4)	Whether perennial or semi-perennial. (5)
		POLLACHI RANGE.		
1.	Puliampatti	Nallar 4	Puliampattiuthu	Perennial.
2.	Karimattupatti	Nallar 7	Mandimalliodaipallam	Semi-perennial.
3.	Thannisholapatti	Thulukkamadai 2	Thannisholapallam	Do.
4.	Periakundupatti	Nallar 9	Periakundupallam	Do.
5.	Thipputhittupatti	Thulukkamadai 9	Thodagavachikottu	Perennial.
6.	Eachampatti	Nallar 10	Kunduruttipallam	Semi-perennial.
7.	Avarakodipatti	Nallar 9	Erumaikuthu	Do.
8.	Chillamaruthupatti	Nallar 5	Ammaparaipallam	Do.
9.	Villonipatti	Vannanthorai 6	Villoni ar	Perennial.
10.	Kokkumalaipatti	Vannanthorai 8	Attakattipallam	Semi-perennial.
11.	Othakundupatti	Vannanthorai 7	Chinnar	Perennial.
12.	Punkoothupatti	Vannanthorai 4	Pungoothu	Perennial.
13.	Chinnamanayakkampatti	Thulukkamadai 2	Chinnamanayakkanpallam	Semi-Perennial.
14.	Kambukadupatti	Thulukkamadai 6	Kambukadupallam	Do.
15.	Do.		Do.	Do.
16.	Uppukuzhipatti	Nallar 2	Uppukulipallam	Do,
17.	Edavalapatti	Thulukkamadai 10	Boothakundupallam	Do.
		PUNACHI RANGE.		
1.	Boothakundupatti	Thorakadavu 4	Arugampattipallam	Semi-perennial.
2.	Arugampatti	Do. 3	Do.	Semi-perennial.
3.	Gandraopatti	Do. 4	Thorakadavu	Perennial.
4.	Thanakalpatti	Do. 2	Thorakadavu	Perennial.
5.	Kosrapatti	Do. 2	Thorakadavu	Perennial.
		UDUMALPET RANGE.		
1.	Karumuttipatti	Karumutti 5	Thorakadavu	Perennial.
2.	Puliyolipotti	Karumutti 6	Do.	Do.
3.	Nadumalaipatti	Thirumurthi 1	Nallar	Semi-perennial.
4.	Thimmunjipatti	Karumutti 4	Thimmunjipallam	Do.
5.	Sanduvilavupatti	Konalar 7	Kolathupallam	Do.
6.	Kanuvoipatti	Pundi-Mavadup 2	Vattaikaranpallam	Do.
7.	Mochokuthipatti	Do. 6	Nallar	Perennial.
8.	Karimarathupatti	Do. 9	Thorakadavu	Perennial.
9.	Ettimarathupatti	Do. 8	Ettimarathupallam	Semi-perennial.
10.	Poondi	Do. 10	Nallar	Perennial.
11.	Moolaimadakku	Do. 14	Podnalammanar	Semi-perennial.
12.	Narakkalpatti	Do. 13	Nallar	Perennial.
13.	Uppumannani	Do. 15	Uppumannampallam	Semi-perennial.
14.	Melkurumalai	Do. 17	Kurumalaipallam	Perennial.
15.	Kurumalai	Do. 17	Do.	Perennial.
16.	Chinnapattimedu	Do. 20	Chinnapattipallam	Semi-perennial.
17.	Attumalaippatti	Esalthittu 6	Attumalaipallam	Perennial.

Serial number. (1)	Name of pen. (2)	Compartment. (3)	Name of water source. (4)	Whether perenial or semi-perennial. (5)
18.	Poomalaipatti	Konalar 1	Poomalaipallam	Perennial.
19.	Parapatti	Esalthittu 2	Varapattikuli	Semi-perennial.
20.	Kelavipatti	Konalar 1	Kelavikulam	Perennial.
21.	Jallimuthanparai	Esalthittu 2	Kottaiar	Perennial.
22.	Sarakkupatti	Chinnar 3	Chinnar	Perennial.
23.	Puliank nnupatti	Amaravathi 3	Amaravathi	Perennial.
24.	Kodanthur	Kodanthur 13	Chinnar	Perennial.
25.	Kathadumparaipatti	Kodanthur 5	Pambadumsolaipallam	Perennial.
26.	Karisamadai	Amaravathi 4	Amaravathi	Perennial.
27.	Thekkampalipatti	Amaravathi 10	Kaludaikattiodai	Semi-perennial.
28.	Vanjimalaipatti	Amaravathi. 1	Vanjimalaipallam	Semi-perennial.
29.	Alamarathupatti	Amaravathi 3	Varavandi odai	Do.
30.	Erakalampatti	Do. 2	Tenar	Perennial.
31.	Arugampatti	Tenar 6	Tenar	Perennial.
32.	Manjampatti or Mettupatti	Pambar 1	Tenar	Perennial.
33.	Thalinjipatti	Pambar 4	Tenar	Perennial.

SECTION 2—SOFTWOOD PLANTATIONS.

895. Plantations of softwoods (*Ailanthus excelsa*) and *Salmalia malabarica* were raised in the felled fuel coupes of the Ayerangal Series in Pollachi Range during the years 1954 and 1955 and later on in the Pachathanni Fuel series until 1962. A list of the plantations formed is given in Chapter V of Part I. Whereas the softwood plantations raised in the Ayerangal Fuel Series are good, those raised in the Pachathanni series are not as good; the shallow soil with rocky outcrops prevalent in this locality evidently proving unsuitable. Further planting of softwoods in the Pachathanni Fuel series is therefore not suggested. In the Udumalpet Range, softwood planting in the past has not proved successful. No further planting is therefore suggested. While of course it might be possible to raise softwoods successfully in some of the better areas of Pollachi Range, viz., the Sethumadai Block, this is not suggested as these areas have been earmarked for fuel production for which there is a keen demand. There being no other suitable areas in compact blocks outside the regular working circles, further planting of softwoods is not suggested.

896. The existing softwood plantations will be maintained. They will be however deleted from the Fuel Working Circle as the management of these areas will vary. All the softwood plantations raised so far will be constituted into one series—The Pollachi Softwood series.

897. *Rotation.*—The question of rotation to be adopted for the softwood plantations will be left over for consideration at a later date since it is not possible to guage their rate of growth for the locality in the absence of adequate data.

898. *Regulation of the yield.*—Since none of the plantations raised so far would reach an exploitable girth during the tenure of this plan no felling are prescribed. Hence the question of regulation of the yield does not arise at present.

899. *Subsidiary silvicultural operations.* (*a*) *Tending.*—The 1962 softwood plantations will be tended during 1965–66. This will consist of climber cutting and coppicing of damaged and malformed stems.

(*b*) *Thinning.*—The 1954 and 1955 softwood plantations at Ayerangal have been thinned during 1963–64. The question of further thinnings in this plantation will have to be decided after future observations. In the Pachathanni plantations which are comparatively poor, the question of taking up any thinnings in the future will also have to be decided by the District Forest Officer based on future observations after obtaining the prior concurrence of the Conservator of Forests.

(*c*) *Defoliation in Ailanthus excelsa.*—No particular remedial mesures are prescribed for attacks of defoliation by *Eligma narcissus* on *Ailanthus excelsa* as the intensity of damage in older plants is generally light and sporadic and may be therefore ignored. If in any year the pest assumes epidemic proportions, the pupae which collect on the trunk of the plant may be mechanically collected and buried in piles in the ground. This is the only way of combating this pest as most insecticides are not effective.

900. *Other regulations—Grazing.*—Plantations less than 5 years old will be closed to grazing as at present.

SECTION 3—LAC CULTIVATION.

901. Mention has already been made under Chapter V of Part I of the details of lac cultivation now being made around Varagaliar in the Tunacadavu Range. As the results are not very satisfactory due to the heavy rainfall prevalent in this area, it is prescribed that further cultivation of lac in Tunacadavu Range be stopped.

SECTION 4—RECLAMATION OF AREAS HANDED OVER TO THE CINCHONA DEPARTMENT.

902. Mention has been made elsewhere of the details of the lease of a total area of 3,823.51 hectares of forest area in the Kallar and Kadamparai Valleys of Punachi Range to the Cinchona Department. The question of reverting all these areas back to the

Forest Department is now under the consideration of Government. An area of 64.75 hectares so far handed over back to the department has been already planted with Rose gum (*Eucalyptus grandis*). It is suggested that the rest of the Cinchona area also be planted with this species when they are reverted to this department.

903. Preliminary tests conducted at the Cellulose and Paper Pulp Branch of the Forest Research Institute at Dehra Dun on *Eucalyptus grandis* wood grown at Peermade in Kerala under almost similar conditions as in the Anamalais have indicated possibilities of utilising this species in the establishment of a number of cellulose based industries like viscose rayon, nitro-cellulose, tire-cord, etc. The result of the tests carried out are given in Chapter VI of Part I. The availability of perennial water supply in the Kallar also makes it possible to establish the proposed industry in close proximity of the plantations and thereby cut down production costs. Extension of planting of this species over the maximum possible area will be therefore necessary in orler to produce adequate raw material to feed at least one cellulose based industry.

904. *Rotation.*—Any rotation fixed at this juncture will be theoretical as it will have no bearing on the prescriptions made. Tentatively a rotation of 10 years is suggested but this will have to be suitably modified with reference to the requirements of the industry such as total quantity of wood required annually, age and size of billets, etc.

905. *Annual planting area.*—No annual planting area is fixed as the ultimate area that will be made available is not known. Since our object is to afforest the area as early as possible, the areas recovered from the Cinchona Department will be planted as and when taken over subject to a limit of 200 hectares per year.

906. *Regulation of regeneration operations*—(*a*) *Preparation of the planting site.*—Any scrub growth in the area taken over will be cut and burnt in patches. Only a patch burn will be possible if at all any burning can be done. The area will be aligned and staked at an espacement of 3 metres by 3 metres. The area around each stake will be scraped of all weeds to a radius of half a metre and pits 30 centimetres cube will be dug at each stake. Analysis of soil samples in the Kallar Valley reveal that the soil is highly acidic (the pH value ranges bteween 3 and 4) and highly deficient in Calcium. Other macronutrients like Phosphorous and Potash are also significantly deficient. Addition of suitable manure to improve the soil fertility and at the same time neutralise the soil acidity is necessary. Experiments done in Brazil on the uptake of N, P, K, Ca and Mg by *Eucalyptus grandis* (H.P. Haag, F.A.F. De Mello, H.A. Mello, M.O.C. Brasil Sobrinho and A.A. Veiga, 1963) have given the following results :—

Species.	Part of the plant.	Uptake of nutrient elements in grams.				
		N	P	K	Ca	Mg
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Eucalyptus grandis	Leaves	9·02	0·56	4·68	4·64	1·64
	Branches	2·41	0·30	2·46	4·56	0·90
	Trunk	6 49	1·00	8·26	15·04	3·48
	Roots	4·38	0·99	3·66	9·47	2·08
	Total ..	22·80	2·55	19·06	33·71	8·10

Correlating the soil deficiency and the uptake, fertilisation equivalent to 12 grams of N. 18 grams of P2O3. 24 grams of K20 and 40 grams of CaO seems necessary. This can be achieved by applying a fertiliser mixture with a composition of 60 grams of ammonium sulphate, 90 grams of ordinary superphosphate, 40 grams of muriate of potash and 40 grams of lime.

Experiments conducted in Brazil on the comparison of various methods of fertiliser placement in the planting of Eucalyptus (M.O.C. do Brasil Sobrinho. F.A.F. De Mello, N. Rodrigues and H. A. Mello, 1963) have indicated that the best results are obtained either by planting and manuring in the same hole or by application in two doses (part of the dressing in the planting hole and the reminder applied as a top dressing 60 days after planting). Since the latter method is cumbersome and more expensive, planting and manuring at the same time is best suited for application in forestry practices. 230 grams of the fertiliser mixture referred to above will be added per pit immediately before planting. The fertiliser will be well mixed with the soil in the pit. At the same time, 25 grams of Heptachlor, Chlordane or Aldrex dust will be also added per pit in order to prevent termite damage. A number of insecticides effective against termites are available in the market, but of these, Heptachlor is perhaps the cheapest and is also quite effective. No incompatibility has been reported in mixing up the fertiliser mixture and the insecticide in the same pit.

(*b*) *Planting.*—Container plants of *Eucalyptus grandis* will be planted in late May when the first showers are received. It will be disastrous to wait for the regular monsoon to settle down as the rainfall in this region is pretty heavy and many of the seedlings are likely to rot and perish. The seedlings should be about 22 centimetres high at the time of planting.

907. *Nursery.*—The nursery technique for *Eucalyptus grandis* is already described in detail under the chapter on Teak Plantation Working Circle. For reasons mentioned therein, seeds of *Eucalyptus grandis* will be obtained from Australia for a few years until sufficient plantations of this species are raised to supply our own seed, since seed obtained from Munnar or the Anamalai estates is likely to contain a good percentage of hybrid seeds sired by *Eucalyptus robusta.* Quite a few plants in the existing plantations of *Eucalyptus grandis* at Cinchona have shown 'robusta' characteristics, apparently due to hybrid stock. These plants were either got from Munnar or raised from seed collected there. These plants should be therefore uprooted and replaced with pure *Eucalyptus grandis* plants to prevent further hybridisation in our plantations.

908. *Subsidiary silvicultural operations*—(*a*) *First year.*—Casualties will be replaced a fortnight following planting and again in October with the north-east monsoon showers. Weed growth in the Cinchona areas is heavy due to abundant rainfall. At least 4 knife weedings during the first year will be necessary. The first will be done in June–July about a month following planting, the second in August, the third in October and a fourth weeding in December. Two soil workings, one in September and another in December–January are also prescribed.

(*b*) *Second year.*—During the second year, casualties will be replaced in May-June. The entire area will be scraped clean at the same time, as it is proposed to plant Guatemala grass in quincunx. A soil working to a radius of half a metre around the plants will be done in September.

909. *Planting of cover crop.*—A cover crop of Guatemala grass (*Tripsacum luxum*) is suggested to be raised during the second year in order to keep down the weeds. Planting Guatemala grass during the first year is not suggested as it is likely to suppress the tree crop. This grass has been planted freely in the *Eucalyptus grandis* plantations of the Tea Estates India Limited with great success. It is an exotic from Guatemala introduced into India and is a suitable raw material for paper pulp. The writer sent about 100 kilograms of this grass collected from the Nullacathu Estate to the Cellulose and Paper Pulp Branch of the Forest Research Institute at Dehra Dun for preliminary tests and the results are favourable. As a cover crop in the *Eucalyptus grandis* plantations it is also an excellent fodder grass relished very much by hill cattle. It comes up luxuriantly and can keep down weed growth which is a menace in the evergreens.

910. Rhizome cuttings of Guatemala grass will be obtained from one of the estates of the Tea Estates India Limited, and planted in quincunx during the second year in May-June after skinning the entire area. The plants will be weeded twice or thrice until they get established. Once established, Guatemala grass spreads out luxuriously all over the plantations and forms an excellent cover crop. It can be cropped twice every year for about 3 years after planting.

SECTION 5—DEVELOPMENT OF THE GRASS HILLS.

911. Mention has been made in Part I about the existence of extensive areas of grasslands at higher elevations in the Punachi Range. These grasslands extend over an area of approximately 19,000 hectares of which only about 1,200 hectares in the Konalar valley proper can be considered really suitable for regeneration with any tree species, the rest being rocky outcrops or steep hills with ertremely shallow soil, the rock substralum being met within a depth of 1 to 2 metres. These areas are subjected to very heavy rainfall (500 centimetres and over), and since they occupy the highest range of hills (1,650 to 2,100 metres) in the Anamalais, they are subjected to high velocity winds during the south-west monsoon period. The temperature falls considerably during winter and frosts are not uncommon. Between 1950 to 1963, several species have been tried in an attempt to afforest the Grass Hills, but with fruitless results. The results of such planting are analysed in detail in Chapter V of Part I.

912. It would therefore appear ill-advisable to take up large scale planting of any species in the Grass Hills unless it is proved to grow successfully in this region. The Grass Hills form one of the most beautiful spots in the district. While aesthetic reasons might prompt one to leave the Grass Hills alone to serve as a beauty spot, keeping such a vast area fallow without any profitable use may also appear against the canons of forestry and proper land use planning.. It therefore appears to reason to strike a judicious compromise between the two. The Konalar valley proper where the soil is fairly deep enough to permit the growing of a tree crop may be planted, but the rest of the country extending into the high ranges of Travancore must be left alone with its natural loveliness to serve as a tourist resort. These areas are extremely shallow soiled and unsuited for any planting either.

913. As the results of experimental planting in the past are not successful, the writer is unable to suggest any definite species for planting in the Konalar valley. In view of the adverse locality factors, experimentation with suitable exotics must precede any future planting programme. Several species belonging to the genus *Eucalyptus* which are known to thrive under similar climatic conditions in Australia like *Eucalyptus ovata*, *Eucalyptus aggregata*, *Eucalyptus johnstonii* and *Eucalyptus macarthuri* are suggested for trial. Black wattle (*Acacia mearnsii*) although proved to be a failure in the past may be tried again with progressive scraping of the grass around the plants to a width of 1½ metres combined with soil working and application of fertilisers as is now the practice in the Nilgiris. Past planting of wattle in the Grass Hills merely consisted in planting in pits 1 foot cube without any scrape weeding. Since wattle is a very shallow rooted species, one cannot expect it to succeed under such conditions in any grassland planting. The luxurious growth of a few wattle plants on either side of the newly formed Konalar Road wherever the soil has been raked is a pointer to this. Only if any of the experimental trials referred to above succeed, regular planting in the Konalar valley may be taken up on a small scale of 20 hectares annually. A large annual target is not suggested as labour will be difficult to procure during the planting season, when weather conditions on the Grass Hills will be extremely harsh.

914. The entire Grass Hills form a picturesque spot which can be developed to serve as a place of tourist interest particularly during the hot weather. Apart from its scenic beauty, the country abounds with wild life such as the tahr and gaur. The area is closed to shooting along with the rest of the division, but there are plenty of opportunities to view wild life and shoot with a camera. The Rainbow Trout in the Konalar is another attraction. Angling in the river is at present controlled by the Konalar Fishing Association. The area can be developed into an ideal summer picnic spot by providing suitable amenities to sightseers. The forest road from Akkamalai Estate to Konalar valley needs to be developed further to be made motorable. The Konalar Hut which is under the control of the Fishing Association is at present the exclusive preserve of anglers. Construction of a separate forest rest house for sightseers and tourists appears necessary. The rest house must be provided with a watcher-*cum*-cook, as food cannot be had for purchase in this forlorn locality. Once these amenities are provided,

tourism is bound to develop in this region. If tourism can be established, visiting charges can be collected at stipulated rates (which may be fixed later) as done in foreign countries for national parks. This alone can prove to be a profitable proposition.

SECTION 6—PLANTING THE FRINGES OF THE PARAMBIKULAM-ALIYAR PROJECT MAIN CANAL.

915. The Parambikulam-Aliyar Project main canal leads from Tirumurthinagar to Dharapuram and Palladam Taluks amidst virtually treeless country. Scarcity of fuel in these areas is great as all the supplies have to come from elsewhere. The area is subjected to heavy dust storms from May to September when the south-west monsoon winds are blown across the Palghat Gap. The only reserves in this region are the small pockets of ex-panchayat forests. Suggestions for their improvement and rehabilitation have been made elsewhere. These tiny reserves constitute less than one per cent of the land surface in these two taluks and it is therefore necessary to expand the area under forests for the welfare of the local population.

916. It is suggested that an area of one chain width on either side of the Parambikulam-Aliyar Project main canal be acquired by the Forest Department in co-ordination with the Irrigation Department and this thin belt planted up with fast growing fuel species. Agricultural experts have opined that the clayey nature of this tract is likely to result in excessive seepage of water as it traverses through the canal. In order to minimise the seepage of water, the Public Works Department are lining the entire course of the main canal with cement concrete, but it is understood that there will be still some seepage. This will be to the advantage of any tree crop particularly in arid tracts. There is also the added facility of the proximity of perennial water that the plants can be watered during dry weather. *Eucalyptus* hybrid is suggested as this species responds very well when moisture is abundant, although it can come up satisfactory even under comparatively less moisture conditions. The species being fast grown, it can be worked on a short rotation of 10 years and will be ideal to serve the fuel needs of the local populace. Its elegant form will add to the aesthetic appearance of the canal course. Close planting at an espacement of 2 metres by 2 metres is suggested in view of the heavy winds prevalent in the locality. The groves will also serve as a wind break. If in case only a narrow fringe of land is made available making it possible the raising of only 1 to 2 rows of trees, *Eucalyptus* hybrid is not recommended as it is liable to be damaged by winds when grown in isolation. Other species such as silk cotton (*Ceiba pentandra*). *Ailanthus excelsa* and *Pongamia pinnata* may be tried. *Ceiba* and *Ailanthus* are also fairly fast grown. While *Ceiba* and *Pongamia* yield valuable minor forest produce, *Ailanthus* can yield an excellent matchwood.

SECTION 7—REHABILITATION OF AREAS BELOW THE PARAMBIKULAM-ALIYAR PROJECT CONTOUR CANAL.

917. The Parambikulam-Aliyar Project contour canal which emerges from the Sarkarpathy tunnel exit in Uppar 1, extends along the hills up to a distance of about 30 kilometres. Vegetation below the contour canal has been literally buried under blasted stone and other debris excavated in forming the canal. Portions of Thirumurthi 2 to 6 are in particular very badly affected, that it was found necessary to exclude these compartments from the Fuel Working Circle. It is urgenly necessary to afforest these areas with the dual purpose of rehabilitating them as also in stabilising the canal banks from erosion. As much of the excavated earth consists of stone and gravel, traditional fuel species might not perform well. Cuttings of Banyan (*Ficus benghalepsis* and *Lannea coromandelica* will be planted with the onset of the north-cast monsoon. These cuttings will strike root quickly and cover the area. No regular espacement is suggested. Pockets with good soil wherever available will be planted. *Ficus* with its ripe fruits and the availability of perennial water in the proximity will attract a variety of birds along the canal banks. In addition to these cuttings, broadcast sowing of hardy fuel species such as Neem, Tamarind, *Acacia planifrons* and *Acacia ferruginea* may be also done. Even a few survivals of these species will add to the value of the forest.

SECTION 8—SUGGESTIONS REGADING JURISDICTIONAL CHANGES.

918. *Reconstitution of beats*—(*a*) *Pollachi Range*.—The headquarters of the Forest Guard and the Reserve Watcher of Pachathanni beat in Pollachi Range is now Sethumadai. It is suggested that the headquarters of the beat be shifted to Sarkarpathy were the subordinates can be housed in some of the surplus buildings of the Electricity Board after the erection of the powerhouse is over. The existing quarters of the Forest Guard and Reserve Watcher at Sethumadai can be allotted to the Forest Guard and Reserve Watcher in charge of the *tanahs* at Sethumadai.

The headquarters of the Forest Guard and Reserve Watcher of the Mankarai beat is now at Malayandipattinam which is more than 8 miles from the farthest corner of the beat. The headquarters of these beat subordinates may be shifted to Aliyarnagar which is within 3 kilometres of all portions of the beat. Residential quarters will be also available here after the Public Works Department vacate the surplus buildings with the completion of the project.

The present Villoni beat in Pollachi Range is too large. Further with the completion of the Aliyar Dam, approach to the two wings of the beat will have to be made through two entirely different directions. It is therefore suggested that the beat may be divided into two with the Aliyar river forming the boundary. The two new beats will be known as the Yermakandy and Villoni beats respectively. The headquarters of the new Villoni beat will be fixed at Aliyarnagar where surplus Public Works Department buildings will be available to house the subordinates after the project work is over. The headquarters of the new Yermakandy beat will be fixed at Angalakurichi. The quarters occupied by the Forest Guard and Reserve Watcher of the present Villoni beat at Angalakurichi will be allotted to the beat subordinates of the new Yermakandy beat.

The headquarters of the Forest Guard and Reserve Watcher of the Paruthiyur beat is officially fixed at Paruthiyur, but the subordinates live at Andhiyur another village a couple of miles farther away due to non-availability of rented buildings at Paruthiyur. Both Paruthiyur and Andhiyur are nearly 7 miles from the nearest beat boundary. It is therefore suggested that the headquarters of these subordinates be shifted to Nallar soon after the Parambikulam-Aliyar Project works are over, as residential quarters will be available here in some of the surplus Public Works Department buildings. Nallar also is close to the forests.

(*b*) *Tunacadavu Range*.—The Tunacadavu Range is not divided into any beat charges as protection does not pose a problem here. With the establshment of a Public Works Department colony with a large labour force in and around Topslip, there is likelihood of some petty firewood removal and illicit grazing indulged in by the Parambikulam-Alyar Project labourers and lower subordinates. In order to control this effectively, it is suggested that the Mount Stuart Block alone be constituted into a beat with a Forest Guard in-charge.

A similar colony of the Electricity Board has been established in the Manamboli Valley for erecting the Sholayar Power House No. I. Similar problems are likely to arise here too. There is at present a special duty Forest Guard stationed at Manamboli looking after protection in the valley. It is suggested that the valley (Parayankadavu 2, Palakadavu 100, 103, 104 and 105) be constituted into a regular beat and the Forest Guard be posted in-charge of it.

(*c*) *Udumalpet Range*.—The headquarters of the Forest Guard and Reserve Watcher of Karattur beat is now fixed at Karattur village which is 7 miles away from the nearest end of the beat. It is suggested that the headquarters of these subordinates be shifted to Nallar soon after the Parambikulam-Aliyar Project works are over when residential quarters will be available here. Nallar is quite close to the forests of Karattur beat.

The headquarters of the Forest Guard and Reserve Watcher of Kombu West beat which is now at Manupatti is suggested to be shifted to Chinnar which is closer to this beat. The Forest Guard and Reserve Watcher can be housed in one of the buildings belonging to the Highways Department if they could be made available, or else new buildings will have to be constructed for them.

919. *Reconstitution of sections—(a) Pollachi Range.*—The Pollachi Range is presently divided into 2 sections. The Sethumadai section is particularly heavy due to lot of regeneration works. With the constitution of a separate Eucalyptus Hybrid Working Circle on a short rotation of 10 years, the annual regeneration area in the section is also increased. Some relief to the Forester is therefore necessary. The present Kottur Section consists of 4 beats. When the suggestion to divide the existing Villoni beat into two is carried out, some rearrangement in this section also becomes necessary. It is therefore suggested that the two sections in Pollachi Range be constituted into three sections with headquarters at Sethumadai, Aliyarnagar and Devanur respectively. While a building will have to be put up at Devanur to house the Forester, no such problem arises at Aliyarnagar where some of the surplus Public Works Department buildings will be available after the project works are over. The distribution of beats in each of these sections with their proposed headquarters is shown below :—

Section.	*Beats.*
Sethumadai Section (H.Q. : Sethumadai)	Pothamadai (H.Q. : Sethumadai) Gudaravalli (H.Q. : Sethumadai) Ayerangal (H.Q. : Sethumadai)
Aliyar Section (H.Q. : Aliyarnagar)	Pachathanni (H.Q. : Sarkarpathy) Mankarai (H Q. : Aliyarnagar Villoni (H Q. : Aliyarnagar)
Devanur Section (H.Q. : Devanurpudur)	Yermakandy (H.Q : Angalakurichi) Ardhanaripalayam (H.Q. : Ardhanaripalayam) Paruthiyur (H Q : Nallar.)

(b) *Udumalpet Range.*—The Udumalpet Range is now divided into 2 sections. This entails a very large jurisdiction on both the Foresters. The present arrangement with the Manupatti Forester having jurisdiction over the far flung Dharapuram ex-panchayat forests is also not satisfactory. It is suggested that the Dharapuram forests be constituted into a separate section with headquarters at Dharapuram and the rest of the range divided into 3 sections with headquarters at Easalmanthorai, Manupatti and Amaravathi. The distribution of beats in each of these sections with their proposed headquarters is shown below :—

Section.	*Beats.*
Dhali section (H.Q. : Easalmanthorai)	Karattur (H.Q. : Nallar). Vallakondapuram (H Q. : Karattur). Kurumalai (H Q. : Easalmanthorai). Easalthittu West (H.Q. : Easalmanthorai)
Manupatti Section (H.Q. : Manupatti)	Easalthittu East (H.Q. : Manupatti), Kombu West (H Q. : Chinnar). Kombu East (H Q. : Manupatti).
Amaravathi Section (H.Q. : Amaravathinagar)	Kallapuram (H Q. : Kallapuram). Thalinji (H Q : Thalinji). Manjampatti (H Q. : Thalinji).
Dharapuram Section (H.Q. : Dharapuram)	Uthiyur (H.Q : Uthiyur for the Forest Guard and Dalavoipattinam for the Reserve Watcher.) Garudankottai (H Q : Garudankottai or Rangai Gounden Valasu).

(c) *Punachi Range.*—The are 2 Foresters now stationed at Akkamalai, one for the maintenance of the road leading to Konalar and the other for regeneration work in the Grass Hills. Since both these works are seasonal, it is felt that one Forester will be sufficient to attend to both these works. The second Forester may be therefore utilised for departmental sleeper operation work in the evergreen coupes.

SECTION 9—BOUNDARIES.

920. *State boundaries and district boundaries.*—All state and district boundaries will be maintained in accordance with the orders of the Government in force. The inter-state boundary between Madras and Kerala separating the Mount Stuart Block in Tunacadavu Range with the Thekkadi leased forests in Kerala was never demarcated in the past as it formed part of one division. Now that these areas fall in two separate States, the boundary needs proper demarcation and clearance. The question of demarcating this boundary is now pending with the Kerala Board of Revenue. The clearing of this boundary may be taken up after the demarcation is settled.

921. *External boundaries.*—The clearing and maintenance of the outer boundaries of the reserves shall be the work of the concerned beat subordinates as in the past. The cairns or pillars on the boundary lines should be kept in a state of good repair. Missing cairns will be reconstructed with the aid of the corresponding reserve maps and serially numbered for each reserve forest.

922. Mention has been made in Chapter I of Part I of the existence of some discrepancies between the boundaries of the reserves as they exist on the ground and as represented in the Survey of India maps. These defects must be rectified by actual survey and encroachments if any evicted.

923. *International boundaries.*—Verification of the boundaries between the numerous estates in the Valparai Hills and the reserved forests was taken up during 1961–62 by a Special Deputy Surveyor. The work has again resumed during 1963–64. Only a part of the work has been completed so far. The balance work may be pushed through and completed. The boundaries should be properly demarcated after the survey is over and all encroachments evicted.

924. In practically all the settlements, the hill-tribes have encroached beyond the limits of the land granted to them at the original settlement. Lack of maintenance of boundaries is the sole reason for this. The settlements should be surveyed and encroachments if any regularised. The boundaries of all the settlements should be got cleared annually by utilising the hill-tribes of the particular settlement. The boundaries should be checked annually and a certificate to that effect submitted by the Range Officer to the District Forest Officer.

925. The survey of areas transferred to the Cinchona Department in the Kadamparai Valley should be taken up without delay and the actual area computed. This is necessary in order to correct our maps as also to calculate the lease amount to be collected from the Cinchona Department for the use of these areas.

SECTION 10—FIRE PROTECTION.

926. The following fire protection measures will be carried out :—

Fire-tracing.—(i) Fire tracing around all residential and non-residential buildings including timber depots inside the reserved forests.

(ii) Clearing of existing forest roads, cart-tracks and bridle paths within the division. These roads and paths will serve as efficient fire breaks.

(iii) The annual clearing of external boundaries of the forests by the subordinate staff as prescribed in paragraph 921 should be insisted upon. These will prevent the entry of fires from the surrounding *patta* lands.

(iv) The annual clearing of boundaries of all plantations and inspection paths within the plantations is prescribed. This will prevent any chance entry of fires particularly in the lower foot-hills where no other fire protection measures are adopted.

(v) The compartment boundaries wherever not forming a natural demarcation will be cleared annually. This will help in preventing any chance fires apart from serving the purpose of demarcation.

927. Apart from these general fire protection measures, the following special measures are prescribed for areas vulnerable to fire.

(a) *Tunacadavu Range.*—In addition to the general fire tracing operations prescribed above, the following additional fire lines will be cut in December and traced in January or early in February.

(i) From Pandaravarai along the Pollachi-Tunacadavu Range boundary to where it crosses the ghat road—two guide lines $3\frac{1}{2}$ metres wide will be cut, one on the range boundary and the other 100 metres away from it.

(ii) From the point where the Pollachi-Tunacadavu Range boundary crosses the ghat road to the sheet rock below Kolambumalai covering a distance of 2.5 kilometres —two guide lines will be cut $3\frac{1}{2}$ metres wide about 100 metres apart.

(iii) From Umayamalai to Vengolimalai covering a distance of 6.18 Kilometres — two guide lines will be cut $3\frac{1}{2}$ metres wide and 100 metres apart.

(iv) From Vengolimalai to Chinna along the Kerala boundary to a distance of 4.82 kilometres—two guide lines 100 metres apart will be cut.

(v) From Periyar to Naikundru covering a distance of about 2 kilometres........ one guide line 100 metres away from the Kerala boundary will be cut.

(b) *Punachi Range.*—The areas adjoining Akkamalai and Konalar bear extensive grasslands interspersed with small pockets of sholas. These grasslands are subject to severe fires every year and these fires are responsible for the gradual reduction in the extent of the sholas. It is therefore necessary to undertake effective fire-protection measures in order to protect the shola forests. A guide line 6 metres wide will be cut all round the periphery of each shola at a distance of 4-1/2 metres from the shola margin and early burning will be done in the guide lines. There are 21 sholas in the locality and the approximate cost of fire protection is estimated to be Rs. 100 per year.

928. *Fire patrols.*—Two or three fire patrols will be employed in each range for 3 or 4 months depending on the length of the dry season. They will be deputed to perambulate areas vulnerable to fire and assist the beat subordinates in extinguishing any fires if they occur.

929. *Closure of fire-burnt areas.*—Most of the fires occurring in the division are caused by graziers and collectors of minor forest produce. The former are generally caused purposely for the sake of tender grass which comes up with the first rains after the burn. Such deliberate vandalism can be prevented only by removing the temptation to burn by closing the burnt tract immediately to grazing. The closure in all such cases should be applied before the new flush of grass comes forth so as to deprive the culprits of their objective.

930. *Closure of pens.*—Pens may be closed by the District Forest Officer if areas adjoining them have been severely burnt.

931. *Fire fighting.*—As soon as a fire is noticed, the local forest staff will collect the village officials, contractor's mazdoors of the nearest coupe and hill-tribes from the nearest settlement, and proceed to the spot and extinguish the fire by beating it out with branches or by counterfiring if necessary. An investigation into the cause of every fire will be made and monetary rewards given to forest subordinates who detect persons setting fire to the forest. Such offenders will be prosecuted and all attempts made to get them convicted as a few prosecutions is bound to create fear among the villagers from indulging in such vandalistic practies in future.

932. *Control.*—The following control records will be maintained by the District Forest Officer.

(a) *Fire Control Journals.*—This journal will contain complete information on the following points :

(i) Areas closed to grazing on account of fire.

(ii) Name and length of fire lines burnt with costs.

(iii) The incidence of fire in each reserve in the form of a tabular statement showing:

(a) Total area of reserve ; (b) date of fire ; (c) area burnt ; (d) probable causes of fire; and (e) percentage of area burnt to which special protection is recorded.

(iv) Observations of the District Forest Officer on the adequacy or inadequacy of the fire protection measures prescribed with reasons.

(b) *Fire maps.*—All fires will be marked on a map drawn to a scale of 1 inch = 1 mile (1 centimetre = 0.063 kilometre). Serial numbers will be given to all the fires in chronological order.

SECTION 11—ROADS.

933. *Existing roads.*—A list of existing roads, cart-tracks and bridle paths in the division is given in Chapter V of Part I. All of them will be maintained and progressively improved. The existing road connecting Akkamalai Estate with the Konalar valley needs particular attention if the Grass Hills are to be developed as a place of tourist interest. The roads and paths will be kept free from inflammable material so as to serve as efficient fire breaks.

934. *Formation of new roads.*—Construction of a road connecting the old Kallapuram-Manthorai cart-track with Thalinji and Manjampatti is suggested. There is already an existing bridle-path connecting Thalinji with Manthorai (although portions of it are now submerged), and Thalinji with Manjampatti. The alignment may be suitably altered wherever necessry. The road when constructed will help to extract fuel from the Amaravathi Valley as also in developing the Thalinji-Manjampatti valley into a wild life sanctuary. As this is a major road work, it may be entrusted to the Forest Engineer.

SECTION 12—BUILDINGS.

935. A list of buildings in the division is given in Chapter V of Part I. All the buildings shall be kept in a state of good repair.

936. It is a matter of regret that despite repeated requests, the Government have not sanctioned the electrification of the buildings in the forest colonies at Anamalai Farm, Sethumadai, Topslip and Easalmanthorai although electricity has reached their surroundings for many years now. Early action should be taken to obtain Government sanction to get these buildings electrified.

937. Most of the staff of the division including the District Forest Officer and his office staff at Pollachi lack residential quarters. In places like Pollachi, Aliyar, Attakatti and Topslip, some of the buildings constructed by the Public Works Department and the Electricity Board might become available to the department after the completion of the Parambikulam-Aliyar Project in the course of 2 or 3 years. As the project works get completed in any particular locality, the District Forest Officer should contact the Public Works Department or the Electricity Board in time to secure the required buildings for the department. For such of those staff who cannot be still provided with residential quarters, steps should be taken to construct suitable buildings.

938. The District Forest Officer at Pollachi is now housed in a private building. Perhaps one of the buildings in the Parambikulam-Aliyar Project colony at Pollachi might be available to accommodate the office after the completion of the project. It is suggested that the District Forest Officer contacts the Public Works Department in time to secure a suitable building.

939. Some of the special duty Forest Guards at Sethumadai who have presently no residential quarters can be provided with quarters at Sarkarapathy in some of the Public Works Department or Electricity Board buildings after the Parambikulam-Aliyar Project

works are over and most of the buildings become surplus. Similarly the Forest Guards and Reserve Watchers of Vallakondapuram and Paruthivur beats who also do not have residential quarters can be housed at Nallar in the surplus Public Works Department buildings that will become available after the project is over.

940. The Forester, Manupatti Section and the Forest Guard and Reserve Watcher of Kallapuram also do not have quarters. Accommodation for these subordinates could have been easily had in some of the surplus buildings at Amaravathinagar after the Amaravathi Project was completed. It is a matter of regret that this was not done in time and the buildings that became surplus were taken over by other departments and the Sainik School. As it is understood that the Sainik School will be shortly shifted to Kodaikanal, prompt action may be taken to obtain suitable buildings for the Forester, Forest Guard and Reserve Watcher as soon as the buildings fall vacant. The quarters obtained for the Forester can be allotted to the Forester of the new Amaravathi Section if the suggestion to reconstitute the sections in Udumalpet Range is approved *vide* paragraph 919. For the Manupatti Forester a separate building will have to be put up at Manupatti.

941. There is no possibility for the territorial staff in charge of the Dharapuram forests obtaining any accommodation in surplus Public Works Department buildings. Buildings for these staff should be therefore constructed. Quarters for the Forest Guard and Reserve Watcher of Uthiyur beat may be constructed at either Uthiyur or Dalavoipatnam and for the Forest Guard and Reserve Watcher of Garudankottai beat at either Rangai Goundan Valasu or Garudankottai in some suitable poramboke site. If the suggestion to have a separate Forester for the Dharapuram forests is approved, a suitable building for the Forester will be also necessary at Dharapuram.

942. Construction of quarters for the Forester at the Pollachi Timber Depot was suggested in the past working plan, but the suggestion could not be carried out due to the shifting of the depot to a new locality. Construction of suitable buildings for the Forester, the Depot Clerk and the two Depot Watchers at the new depot site at Pollachi is essential and may be taken up as soon as the timber yard is shifted to the new site.

943. *Elephant camp.*—The elephant camp at Varagaliar is provided only with thatched buildings. Construction of semi-permanent sheds for the elephantmen and labour lines for departmental mazdoors is essential. A camping site for the Forest Veterinary Officer, quarters for the Elephant Forester and a provisions shed-*cum*-kitchen for elephants is also necessary. The elephants are now tethered at the camp on open ground and the site often gets slippery and nasty due to dung and urine particularly during the rainy season. It is false economy to allow elephants to stand prepetually on ground saturated with urine and filth. A cement concrete flooring raised above the ground level with a thatch roofing (never of corrugated iron or asbestos, as these tend to get hot during the day) sufficiently high enough to allow an elephant loaded with fodder to enter is suggested. There should be no walls and the thatch roof should extend sufficiently to keep off the afternoon sun.

944. *Sanitary arrangements.*—Most of the existing subordinates' quarters do not have any toilet facilities. The provision of flush-out latrines to all these buildings as also those proposed for construction is considered essential.

945. *Rest Houses.*—A rest house at Konalar is necessary if the idea of developing Grass Hills as a national park is to be pursued. A rest house at Manjampatti overlooking the Tenar is also suggested. Better furnishing and maintenance of the existing rest houses at Sethumadai, Easalmanthorai and Amaravathinagar are also necessary. Proposals to electrify the rest houses at Sethumadai, Easalmanthorai and Anamalai Farm have been made elsewhere.

946. The rest house at Topslip is temporarily under the control and maintenance of the Public Works Department for use in connection with the Parambikulam–Aliyar Project. The building may be taken over by the department soon after the project works are completed.

947. As the Palakadavu Valley gets submerged in the Parambikulam reservoir, the old Range Officer-*cum*-Range Officer's residence at Palakadavu has been already dismantled and is now being reocnstructed at Topslip to serve as an additional rest house in view of the scarcity in accommodation that is frequently felt at this place. The other two seramby buildings at Palakadavu are proposed to be dismantled and erected at Varagaliar to serve as inspection sheds.

SECTION 13—RAIN GAUGES.

948. The existing rain gauges under the control of the department will be maintained. A number of new rain guages have been set up recently by the Hydro Metric Surveys at several places within the Anamalais. Recordings made by them will be available to the department whenever required. There is therefore no necessary to instal any fresh rain guage anywhere.

SECTION 14—WATER SUPPLY.

949. The existing wells in the division will be maintained.

950. The following suggestions are made to improve the water supply from the Karianshola reservoir and make it potable :—

(*i*) The existing dam is not in good order and water escapes at several places. The leakages must be closed. The level of the dam must be also raised by at least 2 metres. This will add to its storage capacity.

The level of the dam must be also raised by at least 2 metres. This will add to its storage capacity.

(*ii*) The reservoir should be desilted in order to improve its storage capacity. Periodic dredging at least once in a year is also necessary.

(*iii*) The approach to the foreshore must be cut steep to prevent wildlife like gaur and elephants from stepping into the water and dirtying it.

(*iv*) Chlorination of the water at least once in a week should be done in order to make it potable.

(*v*) Several of the pipes leading from the reservoir have become old and rusty. These must be replaced by galvanised pipes.

SECTION 15—FOREST TANAHS.

951. Two forest *tanahs* are now functioning on the Sethumadai-Topslip ghat road, one at the beginning of the road and the other at the end. Establishment of a similar tanah near the Aliyar-Project House at the foot of the Punachi Ghat Road and another at the 9/5th mile of the Udumalpet Road is suggested in order to check the movement of timber on these roads and prevent possible poaching.

952. Construction of quarters for the Forester and Forest Guard in charge of each *tanah* close to the site is considered essential.

SECTION 16—TELEPHONE ARRANGEMENTS.

953. The telephone system connecting Pollachi with Varagaliar is at present in a state of disrepair. A well maintained telephone system is essential in order to watch the movement of departmentally extracted timber. It is understood that the Public Works Department proposes to lay an automatic line from Parambikulam to Pollachi connecting Topslip. When this new line is erected, it is not necessary for the department to maintain a duplicate line between Topslip and Pollachi. Connection can be had from the regular line at Topslip, Sethumadai and Pollachi Depot. From Topslip to Varagaliar the departmental telephone line can be maintained as the Public Works Department are unlikely to have a telephone system in this locality.

SECTION 17—LIVESTOCK.

954. There are at present 16 elephants in the division including those under training. The main elephant camp is at Varagaliar in Tunacadavu Range, but a few elephants are maintained temporarily at Palakadavu for dragging timber exploited in the Palakadavu submergible areas.

955. The existing elephant strength is not sufficient and the position may not improve even after exploitation in the Palakadavu submergible areas in completed, as it is proposed to take up departmental exploitation of sleepers in future. Elephant capturing operations will be continued as at present. The pit method will be employed. The number of pits to be covered and their location will be decided annually by the District Forest Officer in consultation with the Forest Veterinary Officer.

956. There is at present only one permanent *kraal* at Varagaliar elephant camp. Since this is quite insufficient, construction of one more permanent *kraal* is therefore suggested. The flooring of the *kraal* should be of cement concrete and raised a little above the normal ground level in order to provide for better sanitation and drainage.

957. Suggestions for constructing semi-permanent buildings in the elephant camp have been already made in the section under buildings.

SECTION 18—HEALTH.

958. *Anti-malarial measures.*—No special anti-malarial measures are suggested as the incidence of the disease is practically nil. However, prophylactic measures such as annual spraying of synthetic insecticides in dwelling places and stagnant pools, clearing of marginal vegetation around habitation, etc., may be continued to be carried out with the co-operation of the Unit Officer, National Malaria Eradication Programme until it is felt that the scourge has been completely wiped out from this country.

959. *Dispensary at Topslip.*—The Government Dispensary at Topslip has now a Junior Assistant Surgeon in charge. The doctor looks after the Parambikulam-Aliyar Project staff also for which he is paid additional remuneration. The District Forest Officer must see that the doctor visits the various camps in the range regularly and systematically.

960. The hospital building at Topslip is provided with a temporary electric fitting by the Public Works Department. The building is ill-ventilated and dark even during the day. It would be advisable to shift the hospital to a bigger and more ventilated building if one becomes available when the Public Works Department vacate most of the buildings at Topslip after the project works are over. Provision of a few beds at the hospital with a nurse to look after serious cases needing closer medical attention is also necessary

961. *Eradication of small-pox.*—The scourge of small-pox among the hill tribes of Udumalpet Range has been already described in Chapter I of Part I. Range Officers should ensure periodic vaccination of the hill-tribes by requisitioning the public health staff in order to prevent future out-breaks. More than this, the hill tribes should be educated to desist from the practice of penning cattle too close to their settlements as poor sanitation predisposes small-pox. The hill tribes should be also insisted to keep their huts and surroundings more tidy. This can be achieved only by persuasion and will therefore take time. Educating tribal children on the importance of sanitation and healthful living should form an important part of school curriculum in all tribal schools. This alone will go a long way in helping the tribes to get rid of their age-old taboos and traditions.

SECTION 19.—WOOD'S GRAVE.

962. An area of 4 chains long and 3 chains wide symmetrically disposed round the grave of the late Hugo Wood in the 1916 teak plantation below the Mount Stuart Bungalow has been demarcated as a permanent preservation plot. The teak crop within the

area is being thinned and tended regularly so as to favour the best trees, that a final crop of the teak trees originally planted by the late Hugo Wood will form in perpetuity a living memorial to him. With the reorganisation of states, it is observed that the new inter state political boundary between Madras and Kerala runs through this plot. It will be most unfortunate if political considerations are made to outweigh the works of a pioneer and several trees within the plot cut to make room for the demarcation line. It is suggested that the demarcation line running through the length of the plot be left uncleared so as to preserve its sanctity. As the pioneering work of Wood was done the composite Madras State, it will be fitting if the entire plot is retained in Madras State for future maintenance. It will be necessary to obtain an inter-state agreement on this between the two Governments. Necessary steps in this direction may be taken by the District Forest Officer.

SECTION 20—AMELIORATION OF HILL-TRIBES.

963. The condition of hill tribes in the division and the steps taken so far to improve their lot have been described at length under chapter IV of Part I. Such further ameliorative measures considered necessary are suggested below. The measures suggested are primarily aimed at improving the lot of hill tribes, but keeping in mind the objective that any improvement in their condition should help them to serve the forests [of which they form an integral part] in a more satisfactory manner than at present.

(i) *Soil conservation work in hill-tribe settlements.*—Pulayars and Muduvars constitute the majority of the hill-tribes in the division. Their settlements are restricted to Udumalpet and Punachi Ranges. Most of the lands allotted to them at the time of forest settlement have now turned fallow due to adoption of primitive methods of cultivation. The top soil has been washed away and the soil has ceased to be productive. The Pulayars and Muduvars were generally allotted lands much in excess of their requirements in the original settlement. Such an allotment was probably done with a view to enable these hill-tribes to indulge in shifting cultivation within the area thus allotted, thereby effecting a compromise between their age-old habits and the need to conserve the rest of the forest. Practically all the land thus allotted has been humped and ruined and the hill-tribes have often encroached in desperation beyond their limits into the surrounding forest again with the same disastrous results. It would therefore appear that allotment of any extent of area will not solve the problem if the hill-tribes are allowed to continue their present methods of wasteful cultivation. It is also not necessary to keep such vast areas of land at the disposal of the hill-tribes either. The extent of land required for each settlement should be fixed on the formula of one hectare per family and simple measures of soil conservation like contour terracing and building must be adopted to make the soil productive and prevent further erosion. The District Forest Officer should contact the Harijan Welfare Department which has the necessary funds for tribal welfare schemes and see that the soil conservation programmes are implemented. Lands in excess of the formula fixed should be resumed by the Government and afforested with suitable tree species. Neem, Tamarind, Bamboos and *Terminalia chebula* are suggested for afforesting such areas in the Udumalpet Range and *Eucalyptus grandis* in the Punachi Range. These measures when implemented will bring in more yield to the tribes and also prevent further erosion of soil in the region.

(ii) *Elimination of middlemen exploiting the tribes and formation of co-operative farming societies.*—Efforts should be concerted to eliminate the middleman from exploiting the ignorance and poverty of hill-tribes. Hill-tribes borrow heavily from the land-lords of the plains in almost every form and their agricultural crops are pledged long before they are raised. With a heavy rate of interest tagged on to the loans, the hill-tribes finally get a pittance on their own earnings. This unfair exploitation of the hill-tribes by usurious plainsmen should be put an end to. Hill-tribe co-operative farming societies must be organised in the Udumalpet and Punachi Ranges for sale of rice and provisions to hill-tribes on credit during the lean season. The society must take up and organise cultivation of crops in the areas allotted to settlements and in the *kumri* regeneration area utilising hill-men as labour for which they should be paid wages in cash or kind. The agricultural produce obtained in excess of the requirements of the tribes will be marketed by the society whose profits will be shared by the hill-tribes. The farming societies should consist solely of hill-tribes and be under the control of the Forest Department lest the plainsmen get the chance to exploit. These farming societies are bound to sustain a certain amount of loss to start with due to the inherent laziness of the hill-tribes to work, but any loss incurred by the societies must be subsidised by the Government if the hill-tribes are to improve their lot and get rid of the yoke of the plainsmen.

(iii) *Utilisation of hill-tribes in kumri cultivation.*—The tendency of the Pulayars and the Muduvars to take to shifting cultivation should be profitably made use of by persuading them to take up *kumri* cultivation in the departmental plantations of Udumalpet Range. Most of the *kumri* cultivation done in this range is now taken up by plainsmen as the hill-tribes are either too lazy to take up the work or lack sufficient finances to invest. The latter problem can be solved by allotting the right for *kumri* cultivation to hill-tribes' co-operative farming societies organised by the department, so that the necessary expenses cas be met with. The hill-tribes will be employed as regular labour for the *kumri* cultivation and paid the necessary wages by the society. The agricultural produce will be harvested and marketed by the society and the profits shared by the same hill-tribes who will be members of the society.

(iv) *Collection and marketing of minor forest produce.*—Collection and marketing of minor forest produce in the Pollachi and Udumalpet Ranges through agencies of hill-tribes' co-operative societies on the same lines as in the Punachi and Tunacadavu Ranges is another measure suggested for the amelioration of the hill-tribes. This will help the hill tribes to earn more and improve their lot. Such an arrangement for the Udumalpet Range appears urgently necessary as it has the largest population of hill tribes in the division.

(v) *Better pay scales, and pension and provident fund benefits to Elephant Attendants.*—The Malasars of Tunacadavu Range who are by far the most useful of the hill-tribes in the division are experts in catching and taming elephants. Practically all the *mahouts* and *cavadics* in the range are drawn from this tribe. The service conditions of these attendants are deplorable when compared to their risky duties. They are still treated as work-charged establishment without any pension or provident fund benefits. It is necessary to constitute these attendants under a separate service with an improved pay scale and with pension and provident fund as afforded to other Government servants.

(vi) *Utilisation of hill-men in bee-keeping.*—The Kadars, Muduvars and Pulayars form the main collectors of honey in the division. This tradition of these tribes can be profitably utilised in artificial bee-keeping. Present methods of honey collection adopted in the forest are crude as they involve destruction of combs and a large number of bees. Natural colonies are spotted in the forest; the bees scared away by smoke and fire and the combs are squeezed to extract the honey. The fires often escape into the surrounding areas causing forest fires. The construction of combs is a long process taking the bees much labour, food and time. The honey thus collected is also impure as it is an unwholesome mixture of ripe and unripe honey, pollen, eggs, larvae, pupae, the visceral contents of young bees, charred matter and wax. Such honey has no keeping qualities and is injurious to health. It is suggested that this crude method of honey collection be put an end to and scientific rearing of bees with established apiaries taken up as done in advanced countries. In this method, extraction of honey is done by the honey extractor without destroying the comb and the labour of the bees can be saved. The honey obtained also will be pure and acceptable to the market. The division has a variety of flora in its forests and bee-keeping has great prospects if taken up scientifically. Apiaries with about 25 hives can be installed in each settlement to start with and the number increased gradually. A member of the concerned settlement should be chosen to look after the bees. A Forester trained in bee-keeping for three to six months at Mahabaleshwar will be able to guide and supervise the work in each range. Bee-keeping can not only provide employment opportunities to the hill-tribes, but will also prove a source of increased revenue to the department.

964. In addition to the ameliorative measures suggested above, the District Forest Officer should also take full advantage of the funds provided under the various Tribal Development Schemes to provide the hill-tribes with water, houses, education, veterinary aid, improved seed, agricultural implements, etc., by keeping close contact with the State Harijan Welfare Department which is in charge of executing these schemes. Measures regarding preventive medical aid are already made under the section on ' Health '.

SECTION 21—PRESERVATION OF WILD LIFE.

965. The division is noted for its variety of wild life and the need to preserve them is therefore paramount. A brief sketch of the wild life in the division has been presented under Chapter II of Part I. With the advent of the Parambikulam-Aliyar Project, a large number of officials and labourers are now inside the forest and it is therefore necessary to keep the entire division closed to shooting at least until the project works are fully completed. Beyond this date, it will be sufficient only if areas proposed for constitution as sanctuaries are closed to shooting and the rest of the area thrown open for legitimate shooting regulated under the Madras Game Rules. Regulated shooting at least in portions of the division (as against complete closure of the entire division) will help to satisfy interested sportsmen and prevent these selfsame persons from taking to poaching to appease their desires. This will make it easier for the staff to control and the shooting fees levied will incidentally add to the revenues of the division.

966. *Constitution of an inter-state wild life sanctuary around the Parambikulam reservoir.*—The Parambikulam Dam when completed will result in a large artificial reservoir extending over an area of about 2,000 hectares in Madras and Kerala States. The Tunacadavu Dam (which is another in the chain of dams constituting the Parambikulam-Aliyar Project) when completed will result in a smaller reservoir of about 250 hectares in extent entirely within the Kerala State, but quite close to the Parambikulam Reservoir and hardly within 5 kilometres from the present inter-state boundary. The Madras Public Works Department has a proposal to construct two more small dams within the Kerala State across the rivers Thekkadi and Peruvaripallam which are adjacent and within the territory of the Thekkadi leased forests. It is suggested that the entire Tunacadavu Range with the areas in Kerala State immediately adjoining the four proposed reservoirs be constituted into an inter-state wild life sanctuary as a symbol of inter-state co-operation in the forest sector. The Kerala areas comprising of the Sungam and Kuriarkutty Ranges in the Nemmara Division have already been constituted into a sanctuary. The whole area is one continuous geographical terrain within which wild life continuously migrate from place to place entirely oblivious of political barriers. The Parambikulam-Aliyar Project which has emerged as a result of inter-state co-operation between Madras and Kerala States is the outcome of inter-state accord in the irrigation and hydro-electric sectors. Measures to accord an inter-state agreement on the fisheries wealth of the Parambikulam reservoir are already afoot. It will be unique in the history of the country, if inter-state agreement can be reached with reference to wild life preservation also in this region. Necessary steps to achieve this may be taken up with the Kerala Government. If an agreement can be achieved, the inter-state wild life refuge with four reservoirs and deciduous forests all around teeming with wild life will result in a magnificant sanctuary. This sanctuary will afford opportunities to sight-seers and tourists to watch wild life while cruising along the artificial lakes that will be formed. Once the sanctuary is constituted, amenities such as rest houses for tourists, look-out towers, cruising boats and a system of roads along the periphery of the reservoirs will have to be thought of. Other problems like constitution of staff to man the sanctuary will also have to be worked out.

967. *Constitution of ' bison ' sanctuary in the Udumalpet Range.*—The forests south of the Pambar and the Kaludaikatti Odai and comprising of the Manjampatti, Kukkal, Kudrayar, Tenar and Pambar Blocks in the Udumalpet Range is the home of the gaur. Other animals like sambhur, spotted deer, elephants, panthers and tigers are also found in fair abundance although not as plentiful as the gaur. The entire area needs to be developed as a ' bison ' sanctuary.

968. At present, the Kukkal and Kudravar Blocks alone are closed to grazing. Proposals to close the Manjampatti, Tenar and Pambar Blocks also have been made in the section on grazing to enable the gaur population in this region to increase. Other measures such as provision of salt licks in suitable places all over the sanctuary will be also necessary. Planting of fruit trees such as *Syzygium cumini*, Wild mango, Banyan (*Ficus benghalensis*) and *Barringtonia acutangula* all along the streams and rivers of the sanctuary is also suggested in order to increase the avian population. While Banyan can be easily raised by planting shoot cuttings during the monsoon, the other species mentioned can be raised by direct sowings in the field. The entire region is now inaccessible. Construction of a road connecting the Kallapuram-Manthorai cart-track with Thalinji and Manjampatti has already been suggested elsewhere. This may be taken up to start with. More roads within the sanctuary will be necessary later on. A rest house at Manjampatti at a suitable site overlooking the Tenar has been suggested under the section on buildings. The bungalow must be provided with a watcher-*cum*-cook to provide for boarding facilities for wild life viewers.

969. *Development of Grass Hills as a National Park.*—The Grass Hills of Punachi Range apart from being a spot of scenic beauty, teem with gaur and tahr. The area is already closed to grazing. Proposals to develop this area as avenue of tourist interest have been made elsewhere. With proper protection and improvement, this area can be developed into a national park. The Konalar Fishing Association which is in control of the fishing rights over the Konalar river has already taken steps to introduce several varieties of trout in the river.

970. *General suggestions to improve wild life all over the division.*—Mention has been made in Part I of the danger to wild life from grazing animals by the transmission of infectious cattle diseases. It is understood that protective vaccination is available only against rinderpest, anthrax, haemorrhagic septicaemia and black water fever, and steps to inoculate cattle against these diseases should be undertaken. This will be rather difficult to implement in a division in which a large cattle population drawn from innumerable villages in the plains take to grazing. However, it should be possible to implement in restricted localities such as Topslip and Attakatti, and in the various pens of Pollachi and Udumalpet Ranges where the number of cattle can be taken cognizance of. The District Forest Officer will take necessary steps to contact the nearest veterinary staff and get the cattle periodically vaccinated.

971. Suggestions to instal a *tanah* at the foot of the Punachi Ghat road and another on the 9/6th mile on the Udumalpet-Munnar road has already been made under the section on Forest *Tanahs*. These *tanahs* will act as deterrents to poaching.

972. Forest subordinates detecting poaching should be amply rewarded as this will serve as an incentive for similar work in the future.

973. In addition, the District Forest Officer may take such other steps as he considers necessary for the improvement of wild life. In whatever he does, the District Forest Officer must however take personal interest so that the subordinates are convinced that any recalcitrancy on their part will not be tolerated.

SECTION 22—CONTROL.

974. The control records and maps which are to be maintained in the District Forest Office have been dealt with under the various working circles. Brief details of each of these records and the manner in which they should be maintained are given below :—

975. *Control book.*—This record will show all operations actually carried out in connection with the exploitation of forest produce done every year in each felling series as per the prescriptions of the working plan, as well as such exploitation as is neither prescribed nor suggested but is carried out. The yield of timber or other forest produce exploited and the revenue derived therefrom as against the forecast in the working plan will be also entered therein.

976. *Record of works.*—This is a brief record to be written up annually of all works carried out under the prescriptions or recommendations of the working plan as well as such measures as are neither prescribed nor suggested but are carired out.

977. *Register of deviations.*—This is a record showing every case of deviation from the prescriptions of the working plan, the need for the deviation and the authority by whom it was sanctioned.

978. The Control book, Record of works and the Register of deviations will be maintained separately for each working circle and shall be written up annually. A list of the control forms to be maintained for each working circle is given in Appendix VII.

979.—*Control Journal.*—The control journal will give a detailed account of the management of the division. 'The main object of the journal is to record observations on the spot and information not obtainable from prescribed forms'. It will be in short a running commentary on all objects of administration, specially on the extent to which the objects of the working plan have been realized and the extent to which the methods prescribed have been found suitable. The journal is intended to give the District Forest Officer an opportunity for recording suggestions for modification and improvement in the method of working laid down in the working plan. The Control Journal will also include a summary of annual revenue and expenditure in a form to facilitate comparison with the financial forecast made in this plan.

980. The Control Journal will be maintained separately for each working circle and must be written up by the District Forest Officer himself or his Gazetted Assistant. It should be therefore taken to camp and critical observations recorded in it during or after inspection. The Control Journal if maintained properly will be of great help when the plan comes to be revised. A model form showing the headings under which the control journal may be written up is given in Appendix VII. Additional headings that may be required may be inserted. General comments in addition to the prescribed headings may be noted separately at the end.

981. *Fire control journal.*—This is a record maintained separately to show the details of fire protection measures adopted in the division and the results achieved. Details about its maintenance are elaborated in the section on fire protection.

982. *Control maps.*—The control maps will show on a 4 inches = 1 mile (1 centimetre—0.1584 kilometre) scale, the areas proposed for working every year, the area actually worked, areas annually regenerated with the name of the species planted or sown and the date of original planting.

983. *Fire maps.*—These will be separate from control maps and will show the results of fire protection and the areas burnt every year. Serial numbers will be given to all fires in chronological order.

984. A copy of the entries made during the year in the control book, the Record of works, Register of deviations and the Control journal will be submitted to the Conservator of Forests, Coimbatore Circle, soon after the close of each financial year. A copy of the fire map will be also submitted annually to the Conservator for scrutiny. The control maps will be posted regularly and made available to the Conservator of Forests for check at the time of office inspection.

SECTION 23—PLANTATION AND NURSERY JOURNALS.

985. In addition to the control forms prescribed under the previous section, plantation and nursery journals will be maintained wherever artificial regeneration operations are involved.

986. *Plantation journal.*—A plantation journal will be maintained for each plantation showing its location, area, a sketch of the plantation on a scale of 16 inches to a mile (1 centimetre—0.03963 kilometre) the nature of previous growth, the revenue obtained if any by clearing the growth, the details and cost of formation of the plantation, and further history like thinnings, defoliator control, etc.

987. *Nursery journal.*—A nursery ledger or journal will be maintained for each year's nursery showing its location and number, size of beds, species sown, seed-origin, date of sowing, nursery technique adopted, watering regime, cost of maintenance, etc.

988. Both the plantation and nursery journals will be maintained personally by the Range Officer. Inspecting officers will note their remarks in these journals for action to be followed up by the Range Officer. Copies of these journals will be maintained at the District Forest Office also.

SECTION 24—COMPARTMENT HISTORIES.

989. Compartment files in respect of those compartments already formed in the preparation of past working plans have been opened by the concerned Working Plan Officers. They have not been maintained properly and results of past working for many years are yet to be posted. It is prescribed that these records are brought up to date as early as possible.

990. Descriptions of all compartments newly formed in the preparation of this plan have been written up incorporating as many details as could be gathered regarding their past history. The compartment files must be maintained and all details of management or silvicultural interest posted regularly. The revenue and expenditure account should be also progressively posted.

CHAPTER XI—ESTABLISHMENT AND LABOUR.

SECTION 1—ESTABLISHMENT.

991. *Gazetted Staff.*—With the completion of exploitation in the submergible areas of the Parambikulam-Aliyar Project, sanction for the existing temporary post of Assistant Conservator of Forests attached to the division will cease. There is however a strong case for providing a regular Assistant to the District Forest Officer due to all round increase in work. Most of the younger teak plantations in the Tunacadavu Range will regularly require thinnings in future and the area to be thinned annually will also steadily increase. Prescriptions of this plan such as departmental exploitation of evergreen timber for conversion into sleepers in the Punachi Range, raising of teak under irrigated conditions and the over-all increase in regeneration operations will all contribute to the general increase in work. It is therefore suggested that an Assistant Conservator of Forests be regularly posted to this division as an Assistant to the District Forest Officer.

992. *Subordinate establishment.*—(i) *Section Foresters.*—If the suggestion to reconstitute the Pollachi Range into 3 sections and the Udumalpet Range into 4 sections (vide paragraph 919) is implemented, 3 additional Foresters will be necessary.

(ii) *Beat staff.*—If the suggestion to divide the present Villoni beat in Pollachi Range into two (vide paragraph 918) is implemented, an additional Forest Guard and Reserve Watcher will be necessary for the new Yermakandy beat.

If the suggestion to constitute the Mount Stuart Block in Tunacadavu Range into a beat (vide paragraph 918) is implemented, one more Forest Guard will be required for this range.

(iii) *Staff for the Irrigated Teak Plantation Working Circle.*—A staff of one Forester will be required to start with for implementing the prescriptions of this working circle. As the work progresses, a staff of 1 Forester and 2 Forest Guards will be necessary for this working circle.

(iv) *Staff for bee-keeping.*—If the proposal to instal apiaries in the important hill-tribe settlements of the division as suggested in paragraph 963 is implemented, a Forester for each range and one apiary watcher for each settlement will be necessary.

(v) *Staff for camphor distillation in Tunacadavu Range.*—1 Forest Guard will be necessary to look after the collection and distillation of *Ocimum* leaves in Tunacadavu Range.

(vi) *Bungalow Watchers.*—Provision of a Bungalow Watcher to the rest houses at Sethumadai and Easalmanthorai is suggested in the interests of better maintenance of these buildings. These rest houses are frequently occupied and lack of adequate cleanliness is often felt by touring officers. It is too much to expect from a beat guard or Reserve Watcher to clean the rest house premises daily, particularly in these days when there is all round increase in regular work. Hence this suggestion.

Two Bungalow Watchers will be also required for the rest houses at Manjampatti and Konalar to be constructed.

(vii) *Tanahdars.*—Two Forest Guards will be required to man the tanahs that are proposed to be established at the 9/6th milestone on the Udumalpet-Munnar Road and at the foot of the Valparai Ghat Road (vide paragraph 951).

(viii) *Reclamation of Cinchona areas.*—No suggestions are made regarding the requirements of staff for this project as the question of utilising the existing staff of the Cinchona Department will have to be decided first. Moreover, the total area that will be reverted to the department is yet to be decided by Government. The requirements of staff for this project can be therefore taken up after the areas are reverted to the department along with the staff employed therein.

(ix) *Staff for the proposed 'bison' sanctuary in Udumalpet Range, inter-state wild life sanctuary at Parambikulam and Grass Hills National Park.*—Proposals regarding the details of staff required for manning the proposed sanctuaries and national park is not made in this plan, since it is presumed that these will form part of the State Wild Life Organisation.

(x) *Ministerial staff.*—Office work in the Tunacadavu Range has become very heavy and it is considered best to replace the existing tally clerk by a regular clerk. For the District Forest Office, one more typist seems necessary as the existing typist is unable to cope up with the heavy amount of fair-copying. Posts of two Upper Division Clerks and one Lower Division Clerk in the District Forest Office are at present temporary. These require to be made permanent.

SECTION 2—LABOUR.

993. It is expected that the labour problem in the Tunacadavu Range will ease with the completion of the Parambikulam-Aliyar Project. To solve the immediate problem, an increase in the existing daily wages for unskilled labour to Rs. 2.00 per male mazdoor and Rs. 1.25 per woman-mazdoor is suggested. These increased rates although not comparable to the Public Works Department rates will solve the present labour problem to some extent. Other facilities such as construction of semi-permanent sheds for housing labour at Varagaliar and Anaigundi which constitute the two important work centres in the Tunacadavu Range are also suggested. The Harijan Welfare Department is presently constructing houses for the hill-tribes resident at Yerumaparai. Provision of a Willys' Land Rover to the Tunacadavu Range for the transport of labour and staff from the residential colonies to the different work spots seems necessary. The vehicle will prove invaluable particularly during the planting and fire seasons.

994. The hill labour resident at Lower Punachi are already provided with residential buildings constructed by the Harijan Welfare Department. Provision of a primary school at Lower Punachi however appears necessary.

995. In addition to the above prescriptions, the measures suggested for the general amelioration of hill tribes in the division (vide paragraphs 963 and 964) are also directed towards the improvement of labour supply in the division.

CHAPTER XII—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

SECTION 1—FINANCIAL FORECAST.

996. The following statements show :—

1. The estimated revenue and expenditure in respect of each working circle for the period of this plan ; and

2. An abstract of the forecast.

1. TEAK PLANTATION WORKING CIRCLE.

Year. (1)	*Revenue in rupees.* (2)	*Expenditure in rupees.* (3)
1965–66	9,04,550	1,76,800
1966–67	9,05,180	1,86,340
1967–58	10,28,500	1,95,060
1968–69	10,10,780	2,03,870
1969–70	10,13,990	2,00,410
1970–71	10,20,430	2,01,160
1971–72	10,11,180	1,99,670
1972–73	9,83,810	1,96,860
1973–74	9,20,360	1,96,750
1974–75	8,84,200	1,88,320

2. THE EVERGREEN SELECTION WORKING CIRCLE.

1965–66	2,70,690	1,71,440
1966–67	2,70,470	1,70,990
1967–68	2,71,000	1,71,420
1968–69	2,72,850	1,78,780
1969–70	2,71,030	1,76,260
1970–71	2,56,530	1,62,420
1971–72	2,21,000	1,39,260
1972–73	2,37,170	1,49,500
1973–74	2,85,490	1,81,800
1974–75	3,09,040	1,88,880

3. THE FUEL WORKING CIRCLE

1965–66	74,330	5,370
1966–67	74,060	5,370
1967–68	73,710	5,370
1968–69	73,310	5,370
1969–70	74,010	5,370
1970–71	74,600	5,370
1971–72	74,210	5,370
1972–73	74,600	5,370
1973–74	73,670	5,370
1974–75	73,390	5,370

4. THE EUCALYPTUS HYBRID WORKING CIRCLE.

1965–66	21,780	2,500
1966–67	21,710	2,500
1967–68	22,060	2.500
1968–69	22,060	2,500
1969–70	21,790	2,500
1970–71	66,500	2,500
1971–72	1,56,750	2,500
1972–73	1,57,500	2,500
1973–74	1,67,250	2,500
1974–75	1,59,750	2,500

The increase in revenue that is expected from 1970-71 will be due to felling of ***Eucalyptus*** hybrid planations that will be reaching rotation age.

5. The Irrigated Teak Plantation Working Circle.

Year. (1)	*Revenue in rupees.* (2)	*Expenditure in rupees.* (3)
1965-66	4,500	2,750
1966-67	4,500	5,750
1967-68	4,500	6,200
1968-69	4,500	6,500
1969-70	7,000	6,580
1970-71	7,000	6,580
1971-72	7,000	6,580
1972-73	9,000	6,700
1973-74	9,000	6,700
1974-75	9,000	6,700

The slight increase in revenue that is expected from 1970-71 will be from sale of material obtained in thinnings.

6. *The Rehabilitation Working Circle.*—No revenue is expected from this working circle. An annual expenditure of Rs. 9,930 is expected.

7. *The Bamboo Working Circle.*—There will be no expenditure in the working circle. The annual revenue will vary from year to year due to difference in the size of the coupes

Year.	*Revenue in rupees.*
1965-66	41,510
1966-67	52,090
1967-68	42,220
1968-69	41,510
1969-60	52,090
1970-71	42,220
1971-72	41,510
1972-73	52,090
1973-74	52,220
1974-75	41,510

8 *The Minor Forest Produce Working Circle.*—A revenue of Rs. 37,000 and an expenditure of Rs. 1,000 is anticipated every year.

9. *Miscellaneous.*—An annual revenue of Rs. 62,590 and an annual expenditure of Rs. 2,41,810 are anticipated. The revenue will be from grazing, kist amounts collected from cardamom leases, rents of buildings, sale of permits, rental for lands and buildings, renewal of stores, installation and maintenance of apiaries, preservation of wild life, offences, etc. The expenditure will include maintenance of buildings, roads, rainguages, wells, telephone lines and livestock, construction of new buildings and roads proposed in this plan, fire protection, rates and taxes, postages, maintenance and renewal of stores, installation and maintenance of apiaries, preservation of wild life, etc.

10. *Establishment.*—The expenditure towards establishment will be annually Rs. 1,96,220. This can be split up as shown below :—

	Expenditure in rupees
Pay of Officers	10,500
Pay of Establishment	1,53,320
Allowances	**31,640**
Contingencies (Pay of Office Watcher)	760
Total ...	**1,96,220**

11. *Abstract of the forecast.*—**The total estimated revenue and expenditure** for the whole division for each year of the ten years period of this plan is abstracted and given below :—

Year. (1)	*Revenue in rupees.* (2)	*Expenditure in rupees.* (3)	*Surplus in rupees.* (4)
1965–66	14,17,050	8,07,820	6,09,230
1966–67	14,27,700	8,19,910	6,07,790
1967–68	15,41,680	8,29,510	7,12,170
1968–69	15,24,700	8,49,970	6,74,730
1969–70	15,39,600	8,40,070	6,99.530
1970–71	15,66,970	8,26,980	7,39,990
1971–72	16,11,340	8,02,330	8,09,010
1972–73	16,13,860	8,09,860	8,04,000
1973–74	15,97,680	8,42,050	7,55,630
1974–75	15,76,580	8,40,700	7,35,880

997. The foregoing abstract of revenue and expenditure does not include the share or charges on account of the Forest Veterinary Officer, Coimbatore and the Conservator of Forests, Coimbatore Circle and their establishment.

SECTION 2—COST OF THE WORKING PLAN.

998. The cost of preparation of this working plan is given below :—

Particulars. (1)	*Expenditure incurred.* (2) RS. P.
Pay of Officers	13,336·53
Pay of establishment	22,262·82
Dearness Allowance	4,129·17
Other Compensatory Allowances	1,596·40
Fixed Travelling Allowance	2,387·21
Travelling Allowance	5,576·01
Contingencies (including pay of Office Watcher)	6,784·13
Metric measures	138·15
Medical charges	37·58
Working plan works	4,026·86
Total ..	60,274·86

999. One Working Plan Officer in the category of an Assistant Conservator of Forests in the Madras Forest Service, two Rangers, six Foresters, one Lower Division Clerk and four peons formed the establishment of the working plan division.

1000. The Coimbatore South Working Plans Division was formed on 12th July, 1962 and closed on 2nd June, 1964.

SUMMARY OF PRESCRIPTIONS.

CHAPTER I—BASIS OF PROPOSALS.

PARAGRAPHS.

Scope.—This working plan deals with the whole of the Coimbatore South Forest Division 509

Objects of management.—The objects of management are briefly :

(i) to conserve the forests forming the catchment areas of the Amaravathi and the artificial reservoirs to be formed under the Parambikulam-Aliyar Project;

(ii) to exploit, subject to silvicultural principles, the resources of the forests in timber, fuel, bamboos, and minor forest produce :

(*iii*) to increase the productivity of the forests by enforcing rigid protection and by artificially regenerating valuable species such as teak, ***Eucalyptus*** hybrid, etc., in suitable areas :

(*iv*) to raise irrigated plantations of teak and other species utilising the waters of the Parambikulam-Aliyar Project :

(*v*) to rehabilitate the areas recovered from the Cinchona Department in the Anamalais with *Eucalyptus grandis* for production of paper pulp or viscose rayon;

(*vii*) to intensify the production and utilisation of minor forest produce;

(*viii*) to meet the grazing requirements of the local populace;

(*ix*) to ameliorate the conditions of the hill-tribes resident in the forests : and

(*x*) to provide better amenities for the acommodation of the subordinate staff of the division.

Working Circles.—The following working circles have been constituted :

	Area in hectares.
(i) The Teak Plantation Working Circle	2,882 89
(ii) The Evergreen Selection Working Circle	1,330 00
(iii) The Fuel Working Circle	6,282·00
iv) The Eucalyptus Hybrid Working Circle	834·00
(v) The Irrigated Teak Plantation Working Circle ..	115·00
(vi) The Rehabilitation Working Circle	320·50
(vii) The Bamboo Working Circle	11,789·61
(viii) The Minor Forest Produce Working Circle ..	All the reserves excepting areas allotted to hill tribes or leased to other departments.

Blocks and compartments.—Blocks and compartments formed under previous plans are retained. The rest of the area is also divided into permanent blocks and compartments. 513–515

Period of the working plan.—This working plant will be in force for a period of ten years from 1st April, 1965 to 31st March, 1975 ... 516

CHAPTER II—THE TEAK PLANTATION WORKING CIRCLE.

Objects of management.—The object of this working circle is to manage the existing teak plantations as well as to convert suitable patches of moist deciduous forest into pure teak plantations ... 517

General constitution.—The working circle includes the existing teak plantations in the division as also those areas proposed for conversion into teak 518

Area.—The area of this working circle is 2,822.89 hectares. Of this an area of 1,293.89 hectares consists of areas planted already with teak. 519

Blocks and compartments.—The compartments included in the working circle are given 522

Division into planting series.—The working circle is divided into two series. Details of areas included in each series are given 523

Silvicultural system.—The silvicultural system adopted will be the clearfelling system followed by concentrated artificial regeneration ... 527

Subsidiary fellings.—No subsidiary fellings are prescribed 528

Choice of species.—The areas clearfelled will be regenerated with teak primarily. Small portions which tend to be swampy will be planted with *Terminalia tomentosa* or *Eucalyptus grandis*. Shallow out-crops will be planted with *Dalbergia litifolia* and *Pterocarpus marsupium* 529

Rotation.—The rotation is fixed at 60 years in the Tunacadavu Series and 40 years in the Punachi Series. 530

Regulation of the yield.—No regulation of the yield is considered necessary. An area of 80 hectares will be taken up for clearfelling and planted with teak in the Tunacadavu Series 532

Estimate of yield from the clearfelling coupes.—An estimate of the yield from each coupe is given 533

Method of executing fellings.—The annual coupe will be laid out in accordance with the fellings series map by cut lines 2 metres wide. Exploitation of all valuable timber excepting softwood species will be done departmentally. The trees will be enumerated and the marking checked before April. Felling, conversion and dragging to roadside depots will be done departmentally from 1st April to 31st October. The details of each operation are described. The converted logs will be transported to the sale depot at Pollachi by contractors' agency. Top ends left behind in the coupe and all standing softwood trees will be sold in auction with a voidah of 9 months from 1st April of the suceeding year 534–544

Tabular statement of fellings.—A detailed statement of the areas to be felled during the ten year period of the plan is given 545

Regulation of regeneration operations.—The felling slash and cut materials in the coupe will be burnt and reburnt by the middle of March. Aligning and staking at 1.8 metres by 1.8 metres will be completed by the end of March. 1 year old stumps of teak about 25½ centimetres long with 23 centimetres of root and 2½ centimetres of shoot, and 1 to 2 centimetres thick at the collar will be planted with the onset of the premonsoon showers. The method of planting is detailed. Stump planting will be done for rosewood, *Terminalia tomentosa* and *Pterocarpus marsupium* just as for teak. In the case of *Eucalyptus grandis*, container plants will be used 547–548

Nursery.—The nursery techniques for the different species suggested for planting are described 551–556

Subsidiary ***silivicultural*** *operations.*—Casualties will be replaced promptly in the year of planting till the end of August. Six weedings will be done during the first year. During the second year, three weedings will be done. A scrape weeding will be combined with the first weeding. In both the years, the weedings will be combined with climber cutting, debudding and uprootal of *Lantana*. During the third year, one tending is prescribed 567–568

Inter-planting of Camphor Tulsi (*Ocimum kilimandscharicum*) will be done in quincunx during the second year. The details of the technique and the method of harvesting are given 569–571

Thinning will be carried out at the ages of 4, 7, 12, 20 and 29 years. The first two thinnings will be mechanical. The subsequent thinnings will be silvicultural. The marking rules for thinning are given. The thinning programme for fifteen years is indicated. Details of classification of the thinned produce are described 572–578

Other regulations.—Plantation boards will be provided for each plantation 579

Permanent and properly graded inspection paths 2 metres wide will be formed in each plantation 580

The entire working circle will be closed to grazing 581

An exterior fire line 6 metres will be maintained around each plantation. Internal boundaries between plantations will be to a width of 3½ metres. The fire lines will be burnt every year before the 31st January 582

Control.—The control records to be maintained are indicated 583

CHAPTER III—THE EVERGREEN SELECTION WORKING CIRCLE.

Objects of management.—The main object of this working circle is to exploit the saleable species in the evergreen forests, primarily for the production of railway sleepers 584

General constitution.—The working circle will comprise of the tropical wet evergreen forests in the Italiar, Manamboli and Varagaliar valleys that contain a good proportion of mature and over mature stock of saleable species 585–586

Area.—The total area of the working circle is 1,330 hectares ... 587

Blocks and compartments.—The compartments included in this working circle are given 591

Division into felling series.—The working circle consists of one felling-ing series known as the Punachi Felling Series 592

Silvicultural system.—The forests will be worked by the 'selection system' 595–596

Exploitable species.—Evergreen species suitable for production of railway sleepers and acceptable to the Railways, such as *Mesua ferrea, Poeciloneuron indicum, Calophyllum elatum, Hopea parviflora, Palaquium ellipticum, Cullenia rosayroana, Vateria indica* and *Canarium strictum* will be extracted. In addition, other species such as *Dysoxylum malabaricum, Cedrela tonna, Artocarpus heterophullus* and *Ailanthus triphysa* will be also extracted if there is a demand ... 597

Exploitable girth.—The exploitable girth fixed is 2.10 metres ... 599

Rotation.—The rotation is fixed at 150 years 600

Felling Cycle.—A felling cycle of 30 years will be adopted 601

Regulation of the yield.—The yield will be regulated by area 602

Estimate of yield from the annual coupe.—An estimate of the number of exploitable trees that will be available from each coupe and the probable out-turn is indicated 603

Method of executing fellings.—The annual coupe will be laid out in accordance with the felling series map, by cut lines, 2 metres wide. The coupes will be worked departmentally for the production of sleepers. Porotes and top ends left in the coupe after sleeper working will be sold in auction for removal by contractor's agency. Softwood species if in demand will be sold standing 604–607

The marking rules are described. An extraction scheme will be drawn up for each coupe. The marking will be completed by December of the year previous to felling. The period of working will be for one year from 1st April to 31st December. The trees felled will be converted into BG, MG and NG sleepers as per specifications and transported to the Railway Goods Yard at Pollachi through contractor's agency. The sleepers will be passed periodically by the Forest Utilisation Officer. Passed sleepers will be released to the Railways. Rejected sleepers will also be delivered to the Railways at agreed rates or sold in auction if not required by them. Porotes and top ends left in the coupe will be sold in auction after the extraction of sleepers is completed with a voidah of 9 months from April to December. 608–618

Tabular statement of fellings.—A detailed statement of the coupes to be worked during the period of this plan is given 619

Subsidiary silvicultural operations.—Tending of natural cardamom that will appear in felling gaps will be done in the year following sleeper working. Tending of natural regeneration will also be done at the same time. The tending rules are given 620–623

Other regulations.—The entire working circle will be closed to grazing. 624

Coupe stones will be planted at salient corners of each coupe 625

Control.—The control records to be maintained for the working circle are indicated 627

Chapter V—The Fuel Working Circle.

Objects of management.—The main object of management of this working circle is to ensure the sustained production of the maximum quantity of fuel 628

General constitution.—The working circle includes the lower slopes of the hills in the Pollachi and Udumalpet Ranges that can be exploited for fuel. Existing plantations of *Eucalyptus* hybrid and areas suitable for planting with this species are excluded from this working circle 629–630

Area.—The total area of this working circle is 6,282 hectares 631

Blocks and compartments.—The compartments included in this working circle are given 634

Division into felling series.—There will be 8 felling series, of which 3 will be in Pollachi Range and 5 in Udumalpet Range 635

Silvicultural system.—The silvicultural system adopted will be in general the 'coppice with reserves' system, but in coppice coupes or portions of coupes suitable for planting, artificial regeneration will be done under the aegis of *kumri* following felling 638

Choice of species.—In the Pollachi Range where the conditions are moister, more valuable species such as Teak, *Terminalia tomentosa*, *Pterocarpus marsupium*, *Albizzia odoratissima*, *Albizzia lebbek*, ***Tamarindus indica** and **Dalbergia sissoo*** will be planted in the coupes following felling. In the Udumalpet Range where conditions are drier, hardier species such as Tamarind, Neem and *Albizzia lebbek* will be planted 639

Rotation.—The rotation is fixed at 30 years 640

Regulation of the yield.—The yield will be regulated by area ... 641

Method of executing fellings.—The annual coupe will be laid out in accordance with the felling series map by cut lines 2 metres wide. Trees on the outer periphery of the forest adjoining the coupe will be ringmarked and serially numbered to serve as a mark of demarcation. 'Reserved species' such as Tamarind, *Terminalia chebula*, *Sapindus emarginatus*, *Feronia limonia*, *Aegle marmelos*, *Madhuca indica* and *Pangamia pinnata* will be marked and numbered serially; they shall not be felled. Each coupe will be divided into strips ... 642–644

Ryots will be permitted to remove free of cost, manure leaves of non-reserved species in all fuel coupes one year prior to felling ... 649

The coupes will be sold annually and the exploitation of the area will be through the agency of contractors. The *voidah* for working will depend on the area of the coupe and shall commence from the 1st of April. Coupe arrears if any at the end of the *voidah* will be felled except the reserves enlisted above. The felling rules are discussed. The felled produce will be stacked before removal. The contractor may also remove timber and poles extracted from the coupe after getting them hammer marked by the Beat Guard ... 650–653

The contractor will be bound to supply fuel in headloads and small timber for agricultural purposes from the coupe to all ryots and jaggery co-operative Societies at rates to be fixed by the District Forest Officer in consultation with the Collector 654–655

Tabular statement of fellings.—A detailed statement of the areas to be felled during the period of this plan is given 656

Regulation of regeneration operations.—Regeneration of felled coupes will be done by the method of *kumri* if there is a demand for the same. The *kumri* rights will be sold in auction. The standing growth in the coupe will be cut and burnt. The area will be ploughed and mounds .6 metre wide and .3 metre high will be formed 5 metres apart. Sowing of seeds of the chosen species will be done along the mounds during the south-west monsoon showers. In the Udumalpet Range, the mounds will be also staked at intervals of 3 metres and at each stake container plants put. In areas where there is no demand for *kumri*, no sowings will be done 658–665

Nursery.—The nursery technique is described in detail 666–671

Subsidiary silvicultural operations.—Details regarding the tending operations to be done during the first and second years of planting are given 672–675

Thinnings.—A stick thinning will be done in the 5th year in all areas where line sowings have been done 676

	PARAGRAPHS
Other regulations.—The four salient corners of each coupe will be demarcated by cut stone slabs showing the year of working and coupe number	678
Plantation boards will be provided for each plantation	**679**
The areas regenerated will be fenced	680
All felled fuel coupes will be closed to grazing for period of 5 years including the year of felling	681
Control.—The control records to be maintained for the working circle are indicated.	683-684

CHAPTER V—THE EUCALYPTUS HYBRID WORKING CIRCLE.

Objects of management.—The object of this working circle is to ensure the sustained production of the maximum quantity of firewood by conversion of the existing fuel forests of Pollachi Range into pure plantations of *Eucalyptus* hybrid	685
General constitution.—The working circle includes the deciduous lower slopes of the hills of Pollachi Range	686
***Area.*—The area of this working circle is 834 hectares ... ...**	687
Blocks and compartments.—The compartments included in this working circle are given	690
Division into felling series.—The working circle is divided into three felling seres	691
Silvicultural system.—The silvicultural system adopted will be the ' clearfelling system ' followed by systematic artificial regeneration	695
Choice of species.—The species chosen for planting the clearfelled areas will be *Eucalyptus* hybrid	695
Rotation.—Tentatively a rotation of 10 years is fixed	696
Regulation of the yield.—The yield will be regulated by area ...	697
Method of executing fellings.—The annual coupe will be demarcated in accordance with the felling series map, by cut lines 2 metres wide. Enumeration of reserved species and border trees will be done in the same way as prescribed in the chapter on Fuel Working Circle. Each coupe will be divided into strips	698–702
The coupes will be sold annually and the exploitation of the area will be through the agency of contractors. The usual *voidah* given for coupes of the Fuel Working Circle is prescribed and shall commence from the 1st of April. The felling rules will be the same as prescribed for the Fuel Working Circle	703–705
The contractor will be bound to supply fuel in head-loads and small timber for agricultural purposes from the coupe to all ryots and Jaggery Co-operative Societies at rates to be fixed by the District Forest Officer in consultation with the Collector	706–707
Tabular statement of fellings.—A detailed statement of the areas to be felled during the period of this plan is given	708 & 709
Regulation of regeneration operations.—Regeneration of felled coupes will be done by the method of *kumri*. The *kumri* rights will be sold in auction	710 & 711

The standing growth in the coupes will be cut and burnt. The *kumridar* will then plough or otherwise prepare the soil. The area will be staked at an espacement of 3 metres by 3 metres and pits 3 metre cube will be dug at each stake. Container plants of *Eucalyptus* hybrid will be planted on receipt of the first showers of the south-west monsoon. Immediately before planting, 25 grams of 10 per cent Heptachlor or Aldrex will be mixed with the soil in each pit to prevent termite damage 713–721

Subsidiary silvicultural operations.—Casualties will be replaced during the first year as and when they occur. Casualties will be replaced during the second year also along with the south-west monsoon ... 722 & 723

No tending or thinnings are prescribed ... ... 724 & 725

Other regulations.—**Plantation boards will be provided for each plantation** 726

A system of inspection paths will be maintained inside each plantation. 727

All plantations will be closed to grazing for a period of 5 years including the year of felling 728

No special fire protection measures are prescribed 729

Control.—**The control records to be maintained for the working circle are indicated** 730

CHAPTER VI—THE IRRIGATED TEAK PLANTATION WORKING CIRCLE.

Objects of management.—The object of this working circle is to ensure the production of teak poles on a short rotation by the method of irrigation 731

General constitution.—The working circle includes the areas below the Aliyar Feeder Canal and the Sethumadai Canal in the Pollachi Range which can be irrigated by the waters passing through these canals... 732

Area.—The area of this working circle is 115 hectares 733

Blocks and compartments.—The compartments included in this working circle are indicated 735

Division into planting series.—The working circle will constitute only one planting series, viz : The Pollachi Irrigated Teak Plantation series ... 736

Silvicultural system.—The silvicultural system followed will be the clearfelling system in which the existing crop will be clearfelled and planted with teak under the method of irrigation 739

Choice of species.—Teak will be the species chosen for regenerating the clearfelled areas 740

Rotation.—Tentatively, a rotation of 20 years is fixed 741

Regulation of the yield.—The yield will be regulated by area ... 742

Method of executing fellings.—The annual coupe will be surveyed and demarcated by cut lines 2 metres wide The coupe will be exploited through the agency of contractors. A *voidah* of not more than 9 months is prescribed. The contractor will be required to cut all growth within the coupe, but twigs and branches less than 15 centimetres in girth will not be removed as they are required for giving a good burn 743–749

	PARAGRAPHS
Regulation of regeneration operations.—The regeneration operations will be carried out in conjunction with *kumri* cultivation in case more water is let out	751
The regrowth in the coupe as well as the felling slash will be burnt and reburnt. A system of canals will be formed to ensure irrigation by the percolation method. The area will be aligned and staked at an espacement of 1.8 metres by 1.8 metres. Planting will be done with the pre-monsoon showers, supplemented by irrigation water if the precipitation received is inadequate	752–755
Subsidiary silvicultural operations.—The watering schedule for the first four years is detailed. Casualties will be replaced during the first year. The weedings and other cultural operations to be done during the first three years are detailed	761–765
Thinnings will be carried out at the ages of 4, 7 and 13 respectively. The first two thinnings will be mechanical, while the third one will be silvicultural. The marking rules for thinnings are given. The thinning programme for 15 years is indicated. The thinned produce will be converted into poles and fuel, and sold	766–773
Other regulations.—Plantation boards will be provided for each plantation	774
A system of inspection paths will be maintained inside each plantation.	775
All plantations will be closed to grazing for a period of 5 years including the year of felling	776
No special fire protection measures are prescribed	777
Details of staff strength to be employed is indicated	778
Control.—The control records to be maintained for the working circle are indicated	779

CHIPTER VII—THE REHABILITATION WORKING CIRCLE.

Objects of management.—The object of this working circle is to rehabilitate the degraded ex-panchayat forests of the region by artificial regeneration of fuel species best suited to the tract ...	780
General constitution.—The working circle includes such of those areas in the ex-panchayat forests of Dharapuram Taluk considered suitable for regeneration	781
Area.—The total area of this working circle is 320.5 hectares ...	782
Blocks and compartments.—The compartments included in this working circle are given	784
Division into planting series.—The area covered by this working circle is divided into two planting series	785
Silvicultural system.—The silvicultural system adopted will be to artificially restock these degraded areas with suitable fuel species supplementing whatever natural regeneration that may occur	788
Choice of species—*Acacia planifrons*, Neem, Tamarind, *Acacia leucophloea* and *Acacia sundra* are suggested for planting	789
Rotation.—Tentatively a rotation of 30 years is fixed	790
Annual planting area.—An area of 12.5 hectares in the Uthiyur series and 19.6 hectares in the Garudankottai series will be tackled annually.	791
Tabular statement of planting.—A detailed statement of the areas to be planted during the period of this plan is given	792 & 793

Regulation of regeneration operations.—The annual regeneration area will be demarcated by cut lines 2 metres wide. Since moisture is the limiting factor in the areas covered by this working circle, a suitable water conservation technique, viz., the 'saucer' method or the 'trench and mound' method will be adopted depending on the type of country. The espacement adopted will be 3 metres by 3 metres. In the 'saucer' method, pits 30 centimetres cube will be dug at each stake and saucers of 1 metre diameter made around. In the 'trench and mound' method, short trenches 1 metre by 30 centimetres by 30 centimetres will be dug along the contour at the same espacement. Planting with container plants of the chosen species will be done with the onset of the monsoon. Sowing of seeds will be done along the mounds where the 'trench and mound' technique is adopted ... 794 to 799

Nursery.—The nursery technique is described in detail ... ... 800 and 801

Subsidiary silvicultural operations.—Watering will be done once a fortnight for a year after the cessation of the monsoon to help establishment of the seedlings. Casualties will be replaced during the first two years. The weedings and soil workings prescribed for the first two years are detailed ... ... 802 to 805

Other regulations.—Plantation boards will be provided for each plantation 806

The plantations will be fenced for the first 3 years 807

All plantations will be closed to grazing for a period of 5 years including the year of formation ... ... 808 and 809

No special fire protection measures are prescribed 810

A plot mazdoor will be provided for the first year of a plantation ... 811

No special staff is provided 813

Control.—The control records to be maintained for the working circle are indicated 814

CHAPTER VIII—THE BAMBOO WORKING CIRCLE.

Objects of management.—The object of this working circle is to ensure the sustained production of the maximum quantity of bamboos ... 815

General constitution.—The working circle comprises of all areas in the division wherein bamboos occur in workable quantities ... ... 816 and 817

Area.—The total area of the working circle is 11,789.61 hectares, of which the net bamboo bearing area has been estimated to be 9,174 hectares 818

Blocks and compartments.—The compartments included in the working circle are indicated 820

Division into felling series.—The working circle is divided into four felling series of which two are in Pollachi Range and the other two are in Tunacadavu Range. The boundary description of the four series is given 821

Silvicultural system.—The silvicultural system adopted will be the 'Culm Selection system' 825

Felling cycle.—A felling cycle of three years is prescribed 826

	PARAGRAPHS
Regulation of the yield.—The yield is regulated by area	827
Method of executing fellings.—One coupe will be annually exploited through the agency of contractors. A set of rules to regulate the fellings is prescribed. Seventy-five per cent of the estimated yield in the bamboo coupes of Tunacadavu Range will be ear-marked for supply to Seshasayee Papers and Boards Limited, Pallipalayam. The remaining 25 per cent will be utilised by the contractor for sale in the open market	828 to 834
The contractor will be bound to supply bamboos for domestic and agricultural purposes to ryots and Basket makers' Co-operative Societies at rates to be fixed by the District Forest Officer in consultation with the Collector and the Government	835 and 836
Tabular statement of fellings.—Details regarding the coupes to be worked durng the next fifteen years are furnished	837
Other regulations.—The area of this working circle will be open to grazing	838
No special fire protection measures are prescribed	839
Control.—The control records to be maintained for this working circle are indicated	840 and 841

CHAPTER IX—THE MINOR FOREST PRODUCE WORKING CIRCLE.

General constitution.—This working circle includes all areas under the control of the Forest Department in the division	842
The principal items of minor forest produce are given	843
Division of the area.—The division is divided into farms, with the range generally forming a unit. Wherever a particular produce exists in sufficient quantities, or has been specially developed over limited areas (e.g., Cardamom in worked sleeper coupes, *Ocimum kilimandscharicum*, *Rouwolfia serpentina*, etc.) or where the produce involved (e.g., *Avaram* bark, gallnuts, lemongrass, etc.) has specialised industrial interests, they are put up for sale separately. The units of sale are given	844
Agency of exploitation.—Ivory, deer and sambhur horns, the valuable remains of dead animals and specialised items such as camphor tulsi (*Ocimum kilimandscharicum*) and *Rouwolfia serpentina* will be collected departmentally. All other items of minor forest produce will be leased out in open auction, excepting those occurring in the Tunacadavu and Punachi Ranges which will be leased out to the Hill tribes' Co-operative Societies formed in these two ranges. Stone and gravel will be sold on demand to the public at seigniorage rates fixed by the Government	845 to 848
Period of lease.—All minor forest produce sale units will be leased out annually for the *fasli* year from 1st April to 31st March, except *Avaram* bark, for which the lease period will commence from 1st April. The lease period will be two years for gallnuts, while *konnai* bark will be sold on a three year felling cycle. Canes will be sold once in five years	849 to 854
Processing of camphor and *camphor oil.*—The methods need to be employed for the collection and distillation of camphor leaves for production of camphor and camphor oil are detailed	855 to 859

Regulation of regeneration operations.—Cultivation of *Rouwolfia* will be done in selected spots of 1 to 2 hectares in extent. *Rouwolfia* seedlings will be raised from seed in nurseries of standard size and transplanted out at an espacement of .6 metre by .3 metre when 10 to 15 centimetres in size. The plants will be shaded after January until the rains. They will be weeded and soil worked thrice during the year. The plants will be grown on a three year rotation at the end of which the roots will be dug up, collected, air-dried and sent to the Forest Utilisation Officer, Madras for sale. The site will be replanted after exploitation. Suggestions to increase root formation by application of root hormones are also made ... ... 860 to 866

Planting of Tamarind along with other fuel species in felled fuel coupes will be done. In addition, Tamarind farms over an area of 4 hectares will be raised annually in the Udumalpet Range. Vacant spaces in forest colonies will also be planted with Tamarind. Container plants one to two years old will be planted at an espacement of 9 metres by 9 metres and the area given for *kumri* cultivation ... ... 867 to 871

Other regulations.—An amount of 5 paise per every rupee of sale value collected for the lemon grass will be levied on the lessee for permitting him to collect dead wood for distillation purposes 872

One Forest Guard will be appointed for the distillation of *Ocimum* leaves 873

Control.—The control records to be maintained for the working circle are indicated 874

CHAPTER X—MISCELLANEOUS REGULATIONS.

Grazing.—The areas closed to grazing permanently and temporarily are indicated. Burnt areas will be closed as a punitive measure ... 875 to 879

Free grazing will be permitted to the cattle belonging to the Forest Staff of Tunacadavu Range and those stationed at Attakatti, although these areas are otherwise closed to grazing. Cattle owned by the parambikulam-Aliyar Project staff will be also allowed on payment of usual grazing fee ... ... 880 to 882

Grazing in open areas will be regulated by the issue of permits. The whole division will be the grazing unit. Grazing fees will be collected departmentally ... ... 883 to 887

Fodder grass removal in headloads by ryots and co-operative milk supply unions will be permitted only from the reserved forests in accordance with the policy of the Government 888

Penning will be permitted. A list of approved pens is given. 889 to 890

Areas closed to grazing will be demarcated by sign-boards and notified in the Gazette ... ... 892 and 893

The control records to be maintained are indicated 894

Softwood plantations.—No further softwood planting will be done in the division. The existing softwood plantations will be maintained. The 1962 plantation will be tended during 1965-66. The question of thinning in the older plantations will be examined after future observations. If defoliation on *Ailanthus* occurs in epidemic form, the pupae will be collected and buried in the ground as a control measure. Plantations below 5 years of age will be closed to gazing ... ... 895 to 900

	PARAGRAPHS
Lac cultivation.—Since lac cultivation is not successful in Tunacadavu Range, further cultivation will not be done	901
Reclamation of areas handed over to the Cinchona Department.—An area of 3,823.51 hectares in the Kallar and Kadamparai valleys of Punachi Range has been leased out to the Cinchona Department. These areas if reverted to the Forest Department will be planted with *Eucalyptus grandis*. A tentative rotation of 10 years is suggested for this species. An area of 20 hectares will be planted annually subject to areas being made available. An espacement of 3 metres × 3 metres will be adopted. Before planting, 230 grams of fertiliser mixture and 25 grams of 10 per cent Heptachlor, Aldrex or Chlordane will be added per pit. Container plants of *Eucalyptus grandis* will be planted with the first showers of the monsoon. The cultural operations to be done during the first two years of planting are detailed	902 to 908
During the second year, planting of a cover crop of Guatemala grass (*Tripsacum luxum*), is suggested depending on the success of the trials undertaken at Dehru Dun to utilise this species as a raw material for the pulp industry. The grass will be cropped twice annually for about 3 years after planting	909 and 910
Development of the Grass Hills.—The Grass Hills of the Punachi Range will be developed as a tourist resort. Planting of forestry species will be confined only to the Konalar Valley. Experimental trials with several *Eucalyptus* species and wattle (*Acacia mearnsii*) is suggested. Commercial planting will be done only if the trials are successful	911–914
Planting the fringes of the Parambikulam–Aliyar Project Main Canal.—An area of 1 chain width on either side of the Parambikulam–Aliyar Project main canal will be acquired and planted with *Eucalyptus* hybrid at an espacement of 2 metres × 2 metres on a 10 year rotation. Where sufficient width is not available, one or two rows of other species such as *Ceiba pentandra*, *Ailanthus excelsa* and *Pongamia pinnata* will be planted.	915 and 916
Rehabilitation of areas below the Parambikulam-Aliyar Project-contour canal.—Areas below the Parambikulam-Aliyar Project contour canal damaged by excavated earth will be afforested with cuttings of Banyan and *Lannea coromandelica*.	917
Suggestions regarding jurisdictional changes.—Reorganisation of sections and beats by sub-dividing larger ones or shifting the headquarters suitably is suggested	918 and 919
Boundaries.—The inter-state boundary between Madras and Kerala will be cleared after the demarcation is settled	920
The maintenance of the boundaries of the reserves by the local subordinates is emphasised	921 and 922
Internal boundaries between enclosures and the Valparai Estates with the reserves will be verified and settled	923
Fire protection.—The annual clearing of firelines, inspection paths, compartment boundaries, and tracing of fire lines around timber depots and buildings is prescribed. Fire patrols will be employed during the fire season. Fire burnt areas will be closed to grazing. Fire fighting measures to be adopted for accidental fires are prescribed. Fire maps and fire control journals will be maintained	926 to 932

	PARAGRAPHS
Roads.—The existing roads will be maintained and progressively improved	933
A new road will be formed connecting the old Kallapuram-Manthorai cart-track with Thalinji and Manjampatti	934
Buildings—All departmental buildings will be kept in good repair. Buildings not electrified will be provided with electricity. New buildings will be constructed to provide residential accommodation to all staff. Sanitary facilities will be provided to all subordinates quarters	935 to 944
Rest houses will be constructed at Konalar and Manjampatti.	945 to 947
Rain guages.—The existing rain guages will be maintained. Recordings made in the rain guages maintained by the Hydro-Metric surveys will be made use of	948
Water-supply.— The existing wells in the division will be maintained. Suggestions to improve the water supply from the Karianshola reservior are made	949 and 950
Forest tanahs.—A new forest *tanah* will be established at the foot of the Punachi ghat road	951
Quarters will be provided for the existing *tanahdars.*	952
Telephone arrangements.—When the Public Works Department lay an automatic telephone line connecting Pollachi with Parambikulam, connections will be provided to Pollachi Timber Depot, Sethumadai, Topslip and Varagaliar	953
Livestock.—Elephant capturing will be done to add to the elephant strength of the division. One more *kraal* will be constructed.	954 to 957
Health.—Prophylactic measures against malaria will be continued. A few beds will be provided to the hospital at Topslip and the hospital shifted to a better building	958 to 960
Measures to eradicate small-pox are suggested	961
Wood's grave.—The grave will be maintained in tact	962
Amelioration of hill-tribes.—Soil conservation works in hill-tribe settlements are suggested. Other suggestions to ameliorate hill-tribes include formation of co-operative farming societies, utilisation of hill-tribes in *kumri* cultivation, collection and marketing of minor forest produce through formation of co-operative societies in Pollachi and Udumalpet Ranges, provision of better pay scales to elephantmen and utilisation of hill-men in bee-keeping.	963 and 964
Preservation of wild-life.—Various measures to improve the wild-life in the divisions are suggested, such as (*i*) Constitution of an inter-State wild-life sanctuary around the Parambikulam reservoir, (*ii*) Constitution of a 'bison' sanctuary in the Udumalpet Range, and (*iii*) development of the Grass Hills as a national park. Other measures include vaccination of grazing cattle, establishment of a *tanah* at the foot of the Punachi Ghat Road and rewards to forest subordinates detecting poaching cases	965 to 973
Control.—Details regarding the maintenance of the Control Book, Record of Works, Register of Deviations, Control Journal and Control Maps are given	974 to 984

	PARAGRAPHS
Compartment histories.—Compartment files have been opened for all compartments that have been formed. These will be maintained for all artificial regeneration works	985 to 988
Plantation and nursery journals. Plantation and nursery journals will posted up-to-date	989 and 990

CHAPTER XI—ESTABLISHMENT AND LABOUR.

Establishment.—Suggestions are made for providing a regular Assistant Conservator of Forests attached to the division. Proposals are made for employment of more non-gazetted staff if the schemes suggested in the plan are sanctioned, as also for the general increase work ...	991 and 992
Labour—Better wages for labour and provision of a Willys' Land Rover for transport are suggested for the Tunacadavu Range. Construction of a primary school at Lower Punachi is prescribed	993 to 995

* NOTE.—Represents areas submerged in the Aliyar Reservoir.

APPENDIX I.

DIVISION AREA STATEMENT.

Block and compartment.	Fuel Working circle.	Eucalyptus hybrid working circle.	Irrigated teak Plantation working circle.	Bamboo Working circle (overlapping.)	Softwood plantations.	Hill-tribe settlements.	Areas leased out to the P.A.P. and P.A.H.S.	Unworkable area.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Ha.	Ha.	Ha.	Ha.	Ha.	Ha.	Ha.	Ha.	Ha.
POLLACHI RANGE :—									
Sethumadai 1	..	155·00	..	..	11·49	..	..	40·47	206·96
Do. 2	33·50	67·00	..	..	..	..	..	119·76	220·26
Do. 3	62·50	41.50	..	..	..	..	..	99·73	203·73
Do. 4	71·00	71·00	..	..	..	..	..	129·94	271·94
Do. 5	72·00	167·50	..	..	..	..	..	..	239·50
Do. 6	1·00	43·50	..	212·94	3·72	..	..	170·72	212·94
Do. 7	8·00	..	..	156·69	28·00	..	..	120·69	156·69
Do. 8	54·50	95·00	3·50	153·00	..	..	..	..	153·00
Do. 9	0·50	129·00	..	144·95	..	..	..	15·45	144·95
Do. 10	..	..	..	155·39	..	..	..	..	155·39
Do. 11	..	36·00	6·00	177·38	1·94	..	4·85	128·59	177·38
Do. 12	..	..	..	95·00	95·00	17·01	..	..	112·01
Uppar 1	43·50	..	3·50	319·05	17·80	..	6·15	248·10	319·05
Do. 2	44·50	..	6·50	275·01	..	..	..	224·01	275·01
Do. 3	21·00	..	..	187.12	..	..	..	166·12	187·12
Do. 4	..	28·50	..	259·64	16·99	..	..	214·15	259·64
Do. 5	3·00	..	..	306·26	31·16	..	..	272·10	306·26
Do. 6	40·00	..	..	275·83	0·16	..	..	235·67	275·83
Do. 7	30·00	..	..	199·42	0·16	..	..	169·42	199·42
Do. 8	20·00	..	..	325.44	..	..	..	305·44	325·44
Vannanthorai 1	..	..	..	..	..	..	7·11*	242·97	250·08
Do. 2	9·00	..	..	..	..	..	17·16*	156·51	182·67
Do. 3	..	..	..	..	..	..	..	323·09	323·09
Do. 4	..	..	..	..	..	..	..	202·82	202.82
Do. 5	82·00	..	..	..	..	..	40·78*	130·29	253·07
Do. 6	4·50	..	..	..	..	..	0·16*	278·45	283·11
Do. 7	..	..	..	..	..	..	..	263·04	263·04
Do. 8	104·00	..	..	..	..	..	26·87*	205·18	334·05
Do. 9	20·50	..	..	..	..	..	..	235·90	256·40

Thulukkamadai	1		..	35·00	..	..	..	..	..	13·76	176·24	225·00
Do.	2		..	..	..	..	..	..	..	..	264·66	264·66
Do.	3		..	78·50	..	..	..	..	..	..	135·58	214·08
Do.	4		..	18·50	..	..	..	..	..	46·78 *	250.38	315·66
Do.	5		..	163·50	..	..	..	..	..	36·76 *	56·24	250·54
Do.	6		..	11·50	..	..	..	..	..	..	269·75	281·25
Do.	7		..	76·50	..	..	..	..	..	1·78 *	198·92	277·20
Do.	8		..	0·50	..	..	..	..	..	..	239·07	239·57
Do.	9		..	..	..	..	..	..	..	..	365·84	365·84
Do.	10		..	..	..	..	..	..	..	..	290·97	290·97
Nallar	1	..	—	..	..	..	..	..	..	..	297·84	297·84
Do.	2	..	..	..	..	..	..	..	..	..	254·14	254·14
Do.	3	..	..	40·50	..	..	..	..	..	..	251·68	292·18
Do.	4	..	..	109·50	..	..	..	..	..	..	152·33	261·83
Do.	5	..	..	18·00	..	..	..	..	..	..	211·86	229·86
Do.	6	..	..	10·00	..	..	..	..	..	..	178·58	188·58
Do.	7	..	..	10·00	..	..	..	..	..	..	220·26	230·26
Do.	8	..	..	129·50	..	..	..	..	..	..	97·93	227·43
Do.	9	..	..	3.00	..	..	..	..	..	..	255·18	258·18
Do.	10	..	..	9·50	..	..	..	..	..	..	279·44	288·94
Do.	11	..	..	210·00	..	..	..	..	..	..	126·69	336·69

* NOTE.—Represents areas submerged in the Aliyar reservoir.

Block and compartment. (1)		Teak Plantation Working Circle. (2) Ha.	Evergreen Selection Working Circle. (3) Ha.	Bamboo Working Circle (overlapping). (4) Ha.	Areas leased out to the P.A.P. and the P.A.H.S. (5) Ha.	Unworkable area. (6) Ha.	Total. (7) Ha.
TUNACADAVU RANGE—							
Mount Stuart	52	43·50 (10·00)*	..	43·50	..	74·75	118·25
Do.	53	83·50*	..	83·50	..	16·25	99·75
Do.	58	..	..	82·95	..	82·95	82·95
Do.	59	..	..	146·65	..	146·65	146·65
Do.	60	..	..	83·60	..	83·60	83·60
Do.	61	30·50*	..	88·56	..	58·06	88·56
Do.	62	28·50*	..	62·95	..	34·45	62·95
Do.	63	3·50*	..	91·05	..	87·55	91·05
Do.	64	12·00*	..	106·41	..	94·41	106·41
Do.	65	62·00* (23·50)*	..	96·77	..	34·77	96·77
Do.	66	84·50 (7·00)*	..	98·42	..	13·92	98·42
Do.	67	1·00*	..	59·56	..	58·56	59·56
Do.	68	28·50 (0·50)*	..	56·33	..	27·83	56·33
Do.	69	29·00 (27·50)*	..	61·87	..	32·87	61·87
Do.	70	56·50 (1·00)*	..	74·45	..	17·95	74·45
Do.	71	67·00 (22·00)*	..	82·59	..	15·59	82·59
Do.	72	49·50*	..	73·71	..	24·21	73·71
Do.	73	33·00*	..	87·80	..	54·80	87·80
Do.	74	60·50 (32·00)*	..	95·18	..	34·68	95·18
Do.	75	56·00 (28·00)*	..	150·10	..	94·10	150·10
Do.	76	34·50	..	100·36	..	65·86	100·36
Do.	77	35·50	..	101·58	..	66·08	101·58
Do.	78	17·50	..	90·08	..	72·58	90·08
Do.	79	..	..	201.65	..	201·65	201·65
Do.	80	..	..	289·11	..	289·11	289·11
Ulondi.	81	11·13*	..	233·65	..	222·52	233·65
Do.	82	100·69*	..	226·62	..	125·93	226·62
Do.	83	78·99*	..	264·17	..	185·18	264·17
Do.	84	129·93*	..	208·17	..	78·24	208·17
Do.	85	181·33 (171·59)*	..	185·83	..	4·50	185·83
Do.	86	146·13 (1·21)*	..	183·22	..	37·09	183·22
Do.	87	13·23*	..	179·02	28·89+	136·90	179·02
Do.	88	147·95	..	206·87	26·14+	32·78	206·87
Do.	89	169·97	..	257·70	..	87·73	257·70
Do.	90	201·69	..	269·68	..	67·99	269·68
Palakadavu	91	3.56	..	241·19	..	237·63	241·19
Do.	92	1·13	..	215·29	59·81+	154·35	215·29
Do.	93	34·00 (12·63)*	..	217·25	26·22+	157·03	217·25
Do.	94	132·64 (7·67)*	..	251·95	16·51+	102·80	251·95
Do.	95	8·90	..	230·19	0·49+	220·80	230·19
Do.	96	47·75	..	163·49	67·10+	48·64	163·49

Palakadavu	**97**	..	..	**244·43**	..	**244·43**	**244·43**
Do.	98	107·32 (19·26*)	..	196·19	29·30+	59·49	196·19
Do.	99	19·59	..	222·74	19·13+	184·02	222·74
Do.	100	24·60	..	219·17	2·75+	191·82	219·17
Do.	101	..	..	332·25	..	332·25	332·25
Do.	102	..	34·50	147·95	..	113·45	147·95
Do.	103	..	151·00	411·10	1·13+	258·97	411·10
Do·	104	..	151·00	510·27	7·77+	351·50	510·27
Do.	105	110·88	..	333·70	22·50 (3·40)+	200·32	333·70
Perumkundru	1	..	..	..	..	229·05	229·05
Do.	2	..	..	..	..	246·05	246·05
Do.	3	..	..	..	..	244·03	244·03
Do.	4	..	..	..	..	280·85	280·85
Do.	5	..	..	..	..	238·77	238·77
Do.	6	..	..	..	..	263·05	263·05
Do.	7	..	..	..	..	244·43	244.43
Do.	8	..	..	..	..	327·80	327·80
Do·	9	17·81	23·50	..	..	278·31	319·62
Do.	10	3·40	..	..	..	293·24	296·64
Do.	11	..	..	..	..	272·35	272·35
Do.	12	..	..	..	..	238·36	238·36
Do.	13	8·09	..	..	..	290·97	299·06
Parayankadavu.	1	..	30.00	..	..	237·74	267·74
Do.	2	..	102·50	..	..	154·88	257·38
Do.	3	..	..	..	..	204·37	204·37
Do.	4	..	..	..	..	240·79	240·79
Do.	5	..	..	..	..	295·42	295·42
Do.	6	..	..	..	..	295 42	295·42
Do.	7	..	..	..	..	332·65	332·65
Do.	8	..	..	..	..	227·83	227·83
Do.	9	..	..	..	..	294·21	294 21

NOTE—* Represents existing teak plantations

+ Represents areas submergible in the Parambikulam reservoir.

Block and compartment.		Teak Plantation Working Circle.	Evergreen Selection Working Circle.	Eucalyptu grandis plantations.	Areas leased out to the Cinchona Department.	Areas leased out to the P. A. P. and the P.A.H.S.	Hill tribe settlements.	Unworkable areas.	Total.
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
PUNACHI RANGE—		Ha	Ha	Ha	Ha	Ha	Ha	Ha	Ha
Thorakadavu	1	..	..	..	..	..	..	225.81	225·81
Do.	2	..	..	..	..	23·87†	..	311·61	335·48
Do.	3	..	..	..	..	26·70†	..	258.19	284·89
Do.	4	..	..	..	..	26·30†	..	270·73	297·03
Punachi	1	..	..	..	..	..	..	59·89	59·89
Do.	2	8·09*	..	..	..	..	..	69·39	77·48
Do.	3	41·46*	..	..	..	..	..	9·07	50·53
Do.	4	25·09*	..	..	..	..	..	..	25·09
Do.	5	33·77*	..	..	..	..	..	8·31	42·08
Do.	6	66·96*	..	..	..	..	1.63	0·80	69·39
Do.	7	21.47*	..	..	..	..	..	3.21	24·68
Do.	8	29·43*	..	..	..	..	..	..	29·13
Do.	9	43·89*	..	..	..	..	..	14·40	58.29
Do.	10	..	..	..	..	14·56†	..	28·33	42·89
Do.	11	..	..	..	..	6·07†	..	36·20	42·27
Do.	12	..	..	..	..	14·56†	..	44·50	59·06
Do.	13	21·44*	..	..	..	..	..	27·50	48·94
Do.	14	9·94*	..	..	..	..	..	10·73	20·67
Do.	15	..	..	..	..	..	..	27·54	27·54
Do.	16	..	..	..	..	23·87†	..	74·85	98·72
Do.	17	..	..	..	..	13·35†	..	91·44	104·79
Do.	18	..	..	..	..	9·71	..	38·44	48·15
Do.	19	..	..	..	..	25.89†	..	40·26	66·15
Do.	20	..	..	..	..	9·30†	..	64·38	73·68
Waterfall	1	..	..	..	..	..	..	162·68	162.68
Do.	2	..	..	..	..	..	..	145·68	145·68
Do.	3	..	..	..	..	..	..	262·23	262·63
Do.	4	..	..	..	..	..	..	150·94	150·94
Do.	5	..	..	..	..	..	..	239·16	239·16
Do.	6	2·42*	..	..	..	..	..	193·44	195·86
Do.	7	2·02*	..	..	..	..	..	268·21	270 23
Kadamparai	1	..	..	..	3·64	..	..	259·00	262·64
Do.	2	..	..	..	116·54	..	..	217·32	333·86
Do.	3	..	..	..	29·54	..	..	275·59	305·13
Do.	4	..	..	..	63·94	..	..	202·34	266·21
Do.	5	..	..	..	46·13	..	..	198·30	244·43
Do.	6	..	..	..	..	..	..	329·00	329·00
Do.	7	..	..	..	..	..	..	356·52	356·52
Do.	8	..	..	..	..	..	..	350·05	350·05
Do.	9	..	..	..	..	..	..	193·44	193·44

Do.	10	..	..	..	..	..	..	239·97	239·97
Kavurkal	1	..	..	..	..	..	..	313·63	313·63
Do.	2	..	..	..	..	..	..	237·14	237·14
Do.	3	..	..	..	..	..	..	208·43	208·43
Do.	4	..	..	..	..	..	..	267·90	267.90
Iyerpadi	1	..	..	..	..	..	..	203·65	203·55
Do.	2	..	..	..	..	..	..	200·31	200·31
Do.	3	..	..	..	..	..	..	252·92	252·92
Do.	4	..	..	..	..	..	..	236·74	236·74
Do.	5	..	..	..	..	..	..	186·56	186·56
Akkamalai	1	..	..	..	..	..	..	318·89	318·89
Do.	2	..	..	..	..	..	..	216·10	216·10
Do.	3	..	..	..	..	..	..	188·58	188·58
Do.	4	..	..	..	..	..	..	274·78	274·78
Do.	5	..	..	..	..	..	..	349·64	349·64
Do.	6	..	..	..	..	..	..	289·75	289·75
Do.	7	..	..	..	..	..	..	266·68	266·68
Do.	8	..	..	..	..	..	..	295·01	295 01
Do.	9	..	..	..	..	..	..	262·64	262 64
Do.	10	..	..	..	..	..	..	265·47	265·47
Do.	11	..	..	..	..	..	..	193·03	193·03
Do.	12	..	..	..	..	..	..	242·78	242·78
Kallar	1	..	..	..	42·89	..	..	297·44	340·33
Do.	2	..	..	..	4·85	..	..	308·78	313·63
Do.	3	..	..	..	40·87	..	..	295·38	336·25
Do.	4	..	..	..	..	..	..	225·82	225·82
Do.	5	..	..	..	..	..	..	258·99	258·99
Do	6	..	..	..	14·56	..	..	321·69	336 25
Do.	7	..	..	..	23·47	..	..	201·13	224·60
Do.	8	..	..	..	114·52	..	..	132·74	247 26
Do.	9	..	..	..	220·95	..	..	152·98	373·93
Do.	10	..	..	..	214·58	..	..	55·35	269·93
Do.	11	..	..	..	27·11	..	..	173·61	200·72
Do.	12	..	..	..	118·57	..	..	186·16	304·73
Do.	13	..	..	..	287·32	..	..	..	287·32
Do.	14	..	..	..	156·20	..	..	101·99	258·19
Do.	15	..	..	..	201·12	..	..	20·68	221 80
Do.	16	..	..	..	195·46	..	..	57·06	252·52
Do.	17	..	..	..	120·59	..	..	116·15	236·74
Do.	18	..	..	..	235·93	..	..	23·88	259·81
Do.	19	..	..	..	230·26	..	..	12·15	242·41
Do.	20	..	..	..	283·91	..	..	15·56	299·47
Do.	21	..	..	..	163·49	..	..	152·57	316·06
Do.	22	..	44·00	..	217·55	..	..	0·69	262·24
Do.	23	..	..	..	227·02	..	..	12·15	239·17
Do.	24	..	..	..	204·36	..	..	61·11	265·47
Do.	25	..	135·00	..	..	..	..	124·40	259·40
Do.	26	..	..	..	38·04	..	..	166·33	204·37

Block and compartment. (1)	*Teak Plantation Working circle.* (2)	*Evergreen Selection Working Circle.* (3)	*Eucalyptus grandis plantations.* (4)	*Areas leased out to the Cinchona Department.* (5)	*Areas leased out to the P.A.P. and the P.A.H.S.* (6)	*Hill tribe settlements.* (7)	*Un-workable areas.* (8)	*Total.* (9)
	Ha.	Ha.	Ha.	Ha.	Ha.	Ha.	Ha.	Ha.
Punachi Range—*cont.*								
Kallar 27	..	..	..	11·33	..	..	281·66	292·99
Do. 28	..	..	..	..	..	..	263·86	263·86
Do. 29	..	..	..	..	..	..	224·20	224·20
Italiar 1	..	..	..	..	..	..	290·56	290·56
Do. 2	..	..	..	..	..	..	271·14	271·14
Do. 3	..	..	..	..	..	..	261·02	261·02
Do. 4	..	201·50	..	..	..	..	106·53	308·03
Do. 5	..	174·00	0·81	5·67	..	..	118·66	299.14
Do. 6	..	129·00	70·82	21·04	..	..	23·56	244·42
Do. 7	..	156·00	1·86	70·09	..	..	56.13	284·08
Sirukundra	..	..	..	..	..	..	43·70	43·70

NOTE.—* Represents existing teak plantations.

† Represents areas submergible in the Upper Aliyar Reservoir.

Block and Compartment (1)	*Fuel Working Circle.* (2)	*Hill tribe settlements.* (3)	*Areas submergible in the Amaravathi Reservoir.* (4)	*Unworkable area.* (5)	*Total.* (6)
UDAMALPET RANGE—	Ha.	Ha.	Ha.	Ha.	Ha.
Thirumoorthi 1	2·00	..	..	232·31	234·31
Do. 2	66·50	..	..	195·33	261·83
Do. 3	..	..	..	301·89	301·89
Do. 4	..	..	..	237·55	237·55
Do. 5	..	..	..	140·83	140·83
Do. 6	41·00	..	..	132·20	173·20
Do. 7	26·50	..	..	258·80	285·30
Do. 8	21·00	..	..	148·96	169·96
Do. 9	66·50	..	..	145·15	211·65
Do. 10	15·00	..	..	251.28	266·28
Do. 11	122·00	..	..	89·65	211·65
Do. 12	7·00	..	..	227·71	234·71
Jallipatti 1	53·50	..	..	162·60	216·10
Do. 2	23·50	..	..	143·74	167·24
Do. 3	56·00	..	..	108·30	164·30
Do. 4	29·00	..	..	166·86	195·86
Do. 5	..	..	..	265.87	265·87
Do. 6	43·00	..	..	198·19	241·19
Elumalayankoil 1	..	..	..	186·15	186·15
Do. 2	80·00	..	9·71	134·48	224·19
Do. 3	125·00	..	114·52	51·85	291·37
Do. 4	105·00	..	79·31	137·01	321·32
Do. 5	42·50	..	..	327·38	369·88
Do. 6	120·00	..	..	187·96	307·96
Do. 7	45·00	..	..	274·29	319·29
Do. 8	174·50	..	..	146·01	320·51
Chinnar 1	155·50	..	..	46·84	202·34
Do. 2	242·00	..	..	14·57	256·57
Do. 3	278·00	..	..	4·47	282·47
Do. 4	300·00	..	..	44·79	344·79
Do. 5	169·00	..	..	26·05	195·05
Do. 6	108·50	..	..	165·87	274·37
Tenar 1	..	..	..	269·11	269·11
Do. 2	..	..	..	303·91	303·91
Do. 3	..	..	..	268·30	268·30
Do. 4	..	..	..	273·97	273·97
Do. 5	..	..	..	200·31	200·31
Do. 6	..	..	..	240·78	240·78
Do. 7	..	..	..	213·67	213·67
Do. 8	..	..	..	263·45	263·45

Block and compartment.	Fuel Working Circle.	Hill tribe settlements.	Areas submergible in the Amaravathi reservoir.	Unworkable area.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
	Ha.	Ha.	Ha.	Ha.	Ha.
Tenar 9	..	..	..	266·28	266·28
Do. 10	..	..	..	347·22	347·22
Do. 11	..	..	..	295·01	295·01
Amaravathi 1	..	..	..	160·26	160·26
Do. 2	..	..	..	271·95	271·95
Do. 3	..	..	..	262·24	262·24
Do. 4	..	..	..	247.67	247·67
Do, 5	59·00	..	0·81	184·21	244·02
Do. 6	..	..	..	314·44	314·44
Do 7	..	..	..	296·63	296·63
Do. 8	..	..	..	252·52	252·52
Do. 9	118·00	..	..	191·58	309·58
Do. 10	105·00	..	..	110·29	215·29
Do. 11	60·00	..	184·13	118·46	362·59
Do. 12	273·50	..	..	58·34	331·84
Do. 13	192·00	..	..	73·88	265·88
Do. 14	239·50	..	..	67·65	307·15
Do. 15	91·50	..	..	185·71	277·21
Do. 16	196·50	..	..	162·86	359·36
Do. 17	..	..	61·51	164·75	226·26
Do. 18	..	..	140·43	167·13	307·56
Punganodai 1	54·00	..	..	234·13	288·13
Do. 2	..	..	..	218·53	218·53
Do. 3	41·50	..	..	193·21	234·71
Do. 4	38·00	..	..	250·54	288·54
Do. 5	..	..	..	307·15	307·15
Do. 6	53·00	..	..	132·33	185·33
Do. 7	124·50	..	7·68	126·81	258·99
Do. 8	225·00	..	62.32	25·90	313·22
Do. 9	122·50	..	0·64	15·66	138·80
Do. 10	77·50	..	117·35	60·94	255·79
Pambar 1	..	..	..	307·96	307·96
Do. 2	..	..	..	272·35	272·35
Do. 3	..	..	..	225·41	225·41
Do. 4	..	..	..	326·58	326·58
Do. 5	..	..	..	103·19	103·19
Do. 6	..	..	..	206·79	206·79
Do. 7	..	10·92	..	221·39	232·29
Do. 8	..	87·00	..	238·76	325·77
Do. 9	..	..	..	227·83	227·83
Manjampatti 1	..	..	..	238·76	238·76
Do. 2	..	..	..	309·18	309·18
Do. 3	..	..	..	209·22	209·22
Do. 4	..	..	..	400·23	400·23
Do. 5	..	..	..	266.28	266·28

Kukkal 1	..	..	..	286·11	286·11
Do. 2	..	..	..	102·38	102·38
Do. 3	..	..	..	263·85	263·85
Do. 4	..	..	..	249·28	249·28
Do. 5	..	..	..	281·25	281·25
Do. 6	..	..	..	246·45	246·45
Do. 7	..	..	..	270·73	270·73
Do. 8	..	..	..	231·88	231·88
Do. 9	..	..	..	199·91	199·91
Do. 10	..	..	..	220·14	220·14
Do. 11	..	..	..	277·61	277·61
Do. 12	..	..	..	265·87	265·87
Do. 13	..	..	..	240·78	240·78
Do. 14	..	..	..	288·54	288·54
Do. 15	..	..	..	250·50	250·50
Do. 16	..	..	..	239·16	239·16
Do. 17	..	..	..	183·72	183·72
Do. 18	..	..	..	274·37	274·97
Kudrayar 1	..	..	..	174·01	174·01
Do. 2	..	..	..	296·33	296·33
Do. 3	..	..	..	312·82	312·82
Do. 4	..	..	..	291·77	291·77
Kodanthur 1	..	..	..	215·29	215·29
Do. 2	..	..	..	284·09	284·09
Do. 3	..	..	..	250·50	250·50
Do. 4	..	..	..	271·94	271·94
Do. 5	..	..	..	250·09	250·09
Do. 6	..	..	..	358·95	358·95
Do. 7	..	..	..	270·23	270·23
Do. 8	..	..	..	337·91	337·91
Do. 9	..	..	..	249·28	249·28
Do. 10	..	..	..	250·20	250·20
Do. 11	..	..	..	232·29	232·29
Do. 12	..	..	..	219·74	219·74
Do. 13	44·50	..	..	153·79	198·29
Konalar 1	..	..	..	281·66	281·66
Do. 2	..	..	..	250·50	250·50
Do. 3	..	..	..	245·23	245·23
Do. 4	..	..	..	285·30	285·30
Do. 5	..	..	..	293·39	293·39
Do. 6	..	..	..	265·87	265·87
Do. 7	..	..	..	288·94	288·94
Do. 8	..	..	..	292·99	292·99
Do. 9	..	..	..	282·87	282·87
Do. 10	..	..	..	251·71	251·71
Do. 11	..	..	..	320·10	320·10
Do. 12	..	..	..	216·10	216·10

Block and compartment.	*Fuel Working Circle.*	*Hill tribe settlements.*	*Areas submergible in the Amaravathi reservoir.*	*Unworkable area.*	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)
	Ha.	Ha.	Ha.	Ha.	Ha.
Karumutti 1	..	..	..	253·73	253·73
Do. 2	..	..	..	194·24	194·24
Do. 3	..	..	..	308·37	308·37
Do. 4	..	45·32	..	297·84	343·17
Do. 5	..	127·88	..	170 37	298·25
Do. 6	..	2·02	..	276·40	278·42
Esalthittu 1	..	4·45	..	280·44	284·89
Do. 2	..	..	..	294·61	294·61
Do. 3	..	..	..	330·22	330·22
Do. 4	..	..	..	205·98	205·98
Do. 5	..	..	..	198·29	198·29
Do. 6	..	..	..	242·81	242·81
Do. 7	..	..	..	324·55	324·55
Do. 8	..	..	..	251·31	251·31
Do. 9	..	..	..	231·07	231·07
Do. 10	..	..	..	275·59	275·59
Do. 11	..	..	..	336·24	336·24
Do. 12	..	..	..	292·18	292·18
Do. 13	..	..	..	308·37	308·37
Pundi Mavadup 1	..	52·60	..	161·98	214·58
Do. 2	..	68·79	..	174·83	243·62
Do. 3	..	125·45	..	76·89	202·34
Do. 4	..	201·93	..	109·27	311·20
Do. 5	..	54·22	..	149·74	203·96
Do. 6	..	41·68	..	220·55	262·23
Do. 7	..	63·13	..	269·52	332·65
Do. 8	..	10·11	..	302·71	312 82
Do. 9	..	25·89	..	310·35	336·24
Do. 10	..	214·88	..	14·57	229·45
Do. 11	..	214·58	..	5·56	220·14
Do. 12	..	129·49	..	113·32	242·81
Do. 13	..	11·33	..	251·31	262·64
Do. 14	..	..	..	267·09	267·09
Do. 15	..	..	..	256·97	256·97
Do, 16	..	..	..	282·06	282·06
Do. 17	..	..	..	232·29	232·09
Do. 18	..	..	..	259·40	259·40
Do. 19	..	..	..	286·11	286·11
Do. 20	..	..	..	233·09	233·09
Do. 21	..	..	..	288·94	288·94
Do. 22	..	..	..	276·80	276·80

Block and compartment. (1)	*Rehabilitation Working Circle.* (2)	*Unworkable area.* (3)	*Total.* (4)
	Ha	Ha	Ha
Periamanimalai 1	28·50	161·70	190·20
Do. 2	89·50	70·75	160·25
Attamalai 1	78·00	182·20	260·20
Uttaiyur 1	43·00	140·72	183·72
Do. 2	3·00	185·17	188·17
Dalavoipatnam 1	78·50	50·19	128·69

APPENDIX II.

LIST OF RESERVED FORESTS IN THE COIMBATORE SOUTH FOREST DIVISION.

Name of reserved forest.	Date of reservation.	Authority.	Area notified in hectares.	Subsequent changes. Reservation.	
				Authority.	Area notified in hectares.
(1)	(2)	(3)	(4)	(5)	(6)
Manjampatti Block II.	15th October 1896	Notification No. 382, dated 19th June 1896.	1,442·29		..
Kukkal ..	Do.	Do.	4,345·92	..	..
Kudrayar ..	Do.	Do.	1,025·02	..	..
Anamalai ..	1st March 1885.	Notification No. 16, dated 15th December 1884 and G.O. No. 1382, Revenue, dated 15th December 1884. An amended and more accurate description of the boundaries has been approved in G.O. Mis. No. 936, Revenue (Special), dated 26th December 1918, and published at pages 19 and 20 of the *Fort St George Gazette*, dated 7th January 1919.	82,328·03	Notification No. 385, dated 2nd September 1901, published at page 1587 of the *Fort St. George Gazette*, dated 19th September 1901.	122·65
				Notification No. 162, dated 17th March 1914.	3·45
				Notification No. 332, dated 19th June 1916, published at page 792 of the *Fort St. George Gazette*, dated 18th July 1916.	15·84
				Do.	4·94
				Do.	1·25
				Erratum to Notification published at page 264 in the *Fort St. George Gazette*, dated 15th February 1929.	2·51
				Erratum to Notification published at page 413 of the *Fort St. George Gazette*, dated 7th March 1933.	11·83
Tunacadavu ..	18th December 1883.	G.O. No. 1612, dated 2nd August 1879. G.O. No. 760, dated 3rd July 1880 and Notification No. 215, dated 27th November 1883, published at page 861 of the *Fort St. George Gazette*, dated 21st December 1883. An amended and more accurate description of the boundaries has been sanctioned in G O. Mis. No. 936, Revenue (Special), dated 26th December 1918 and published at pages 19 and 20 of the *Fort St. George Gazette*, dated 7th January 1919.	10,926·52	Erratum to Notification No. 241, dated 27th July 1927, ordered in notification, dated 28th February 1933, published at page 413 of the *Fort St. George Gazette*, dated 7th March 1933.	91·35

APPENDIX II—*cont.*

List of Reserved Forests in the Coimbatore South Forest Division—*cont.*

Subsequent Charges.				
Disreservation.		*Net area as per Reserve Book.*	*Net area as per actual computation.*	***Remarks.***
Authority.	*Area notified in hectares.*			
(7)	(8)	(9)	(10)	(11)
	..	1,442·29	1,423·67	..
	..	4,345·92	4,372·53	..
	..	1,025·02	1,074·93	..
Notification No. 519, dated 22nd November 1917, published at page 1317 of the Fort St. George Gazette, dated 11th December 1917.	94·69	..	..	..
Notification No. 104, dated 10th April 1923, published at page 438 of the Fort St. George Gazette, dated 17th April 1923.	2·40	..	..	..
Notification No. 329, dated 8th November 1924, published at page 1381, of the Fort St. George Gazette, dated 8th November 1924.	10·03	..	..	..
Notification No. 241, dated 27th July 1927	14,196·29	..	..	..
Notification No. 191, dated 21st June 1928	0·30	..	..	..
Notification No. 142, dated 28th February 1933, published at page 413 of the Fort St. George Gazette, dated 7th March 1933.	344·09	..	..	..
Notification No. 300, dated 22nd August 1933, published at page 1378 of the Fort St. George Gazette, dated 29th August 1933.	2,953·98	..	..	..
Notification No. 106, dated 12th March 1934, published at page 694 of the Fort St. George Gazette, dated 20th March 1934.	95·50	..	..	..
Notification No. 382, dated 8th November 1935, published at page 1532 of the Fort St. George Gazette, dated 19th November 1935.	61·10	..	..	..
Notification No. 416, dated 9th July 1943	4·98	..	..	..
Notification No. 21, dated 26th December 1918, published at pages 20 to 29 of Part I of the Fort St. George Gazette, dated 7th January 1919.	275·18	64,461·96	62,689·81	..
Notification No. 241, dated 27th July 1927, published at page 1204 of the Fort St. George Gazette, dated 2nd August 1927.	1,538·95	9,804·95	9,647·54	..
Notification No. 300, dated 22nd August 1933, published at page 1378 of the *Fort St. George Gazette,* dated 29th August 1933.	35·31	..	..	..

APPENDIX II—*cont.*

LIST OF RESERVED FORESTS IN THE COIMBATORE SOUTH FOREST DIVISION—*cont.*

Name of reserved forest.	*Date of reservation.*	*Authority.*	*Area notified in hectares.*	*Seebsequent changes.* *Reservation.* *Authority.*	*Seebsequent changes.* *Reservation.* *Area notified in hectares.*
(1)	(2)	(3)	(4)	(5)	(6)
Punachi	18th December 1883.	G.O. No. 1612, dated 2nd August 1879. G.O. No. 760, dated 3rd July 1880 and Notification No. 215, dated 27th November 1883, published at page 861 of the *Fort St. George Gazette*, dated 21st December 1883. An amended and more accurate description of the boundaries has been sanctioned in G.O. Mis. No. 936, Revenue (Special), dated 26th December 1918 and published at pages 19 and 20 of the *Fort St. George Gazette*, dated 7th January 1919.	1,270·98	G.O. No. 527, Revenue, dated 8th March 1916, published at page 360 of the *Fort St. George Gazette*, dated 23rd May 1916.	35·76
Amaravathi	18th December 1883.	Do.	13,496·08	..	..
				Government Notification No. 439, dated 30th May 1940, published at page 714 of Part IA—of the *Fort St. George Gazette*, dated 4th June 1940.	92·67
Attamalai	10th January 1893.	Notification No. 13 (Revenue), dated 10th January 1893.	2,161·73	..	..
Periamanimalai.	4th August 1893.	Notification No. 708 (Revenue), dated 7th August 1893.	389·48	..	..
Uthiyur	4th May 1894.	Notification No. 309 (Revenue), dated 4th May 1894.	377·18	..	..
Dalavoipatnam	6th April 1893.	Notification No. 276 (Revenue), dated 6th April 1893.	124·90	Notification No. 529, dated 10th November 1913.	6·14

APPENDIX II—*cont.*

LIST OF RESERVED FORESTS IN THE COIMBATORE SOUTH FOREST DIVISION—*cont.*

Subsequent Charges.				
Disreservation.		*Net area as per Reserue Book.*	*Net area as per actual computation.*	*Remarks.*
Authority.	*Area notified in hectkres.*			
(7)	(8)	(9)	(10)	(11)
.. ..	1,306·75	..	..	..
Notification No. 362, published at pages 20 to 23 of the *Fort St. George Gazette,* dated 1st December 1925.	82·55		..	—
Notification No. 403, dated 6th December 1226, published at page 2474 of the *Fort St. George Gazette,* dated 14th December 1926.	10·11	—	..	..
.. ..	..	13,496·08	14,271·56	..
.. ..	..	261·73	260·21	..
Area excluded in Collector's No. 12837/27, dated 8th December 1937 ..	2·17	387·31	350·15	—
Notification No. 196, dated 6th June 1929	8·97	376·21	371·89	—
.. ..	..	131·04	128·69	—

APPENDIX III.

RIGHTS AND CONCESSIONS ADMITTED IN THE RESERVED FORESTS OF COIMBATORE SOUTH DIVISION.

(a) *Anamalai Reserved Forest.*

The following are the rights of way admitted and recorded and they are 10 yards wide unless otherwise specified : —

(1) Right of way from survey field No. 1026 of Vettaikaranpudur Village to Malai-Perumalswamikoil. The right of way to the temple is admitted for the Malasar community and it enters the Anamalai reserve between cairns Nos. 162 and 163 at the south-west corner of survey No. 1026 of Vettaikaranpudur village and runs in a slightly south-easterly direction for about one furlong to the temple.

(2) Right of way by the path now in use to the channel and Public Works Department anicut irrigating the Atur lands (the latter is on the Chinnar situated about half a mile within reserve south of Muttithorai). The path enters the Anamalai Reserve between cairns Nos. 262 and 263 on the south of survey field No. 1454 of Kottur village and runs westward within the reserve almost following the reserve boundary to the anicut on the Chinnar from whence the channel takes its source. The distance of the path is about half a mile.

(3) The Anamalai Ghat road (right of way from Kottur to Anamalai Coffee Company's Coffee Estates situated on Punachi hills and in that neighbourhood. This is now known as the Punachi Road. The right of way given at the time of settlement was as far as the Waterfall Estate only. After the opening up of coffee estates on the Anamalais, this was converted into a *pucca* metalled road, and extended further on southwards. (This is now termed as the Anamalai Public Works Department Ghat road and its description is given below). The road begins at Vannanthorai and enters the Anamalai Reserve Forest between cairns 274 and 275 at the south-west corner of field No. 405 of Kottur Village, runs first in a south-westerly direction for about half a mile and then turning south-east, it runs up the ghat and passes through St. Catherine and Waterfall Estates and leaves the latter estate at about the first furlong after the 14th milestone, then it turns south as far as 19/4 milestone, then it turns south-west and ends at 31/6 milestone. The total distance from the reserve boundary is about 31 miles and the average width is 100 feet. Right of way over the Anamalai ghat road is admitted to a width of 200 feet at the 7th mile 5th furlong and the 14th mile 3rd furlong instead of 100 feet at the 7th mile 5th furlong and the 14th mile 3rd furlong instead of 100 feet as originally admitted.

Note.—At Attakatti, the 7th mile and at Iyerpady 20/2 mile, the Public Works Department has constructed two rest houses with out-houses over an area of about ten and five acres respectively. The road to the rest house at Iyerpady branches from the main road at 19/4 milestone.

4. ***Villoni bridle path.***—This begins at about the bridge near the second milestone on the Anamalai ghat road (1-3) and runs almost south-west and meets the Anamalai Ghat road at 24/3 milestone. The length of the road is 14 miles and the average width, 30 feet.

5. *Iyerpady branch road.*—This road from the Anamalai ghat road (II-3) at 10/4 milestone and runs in a south easterly direction to Iyerpady, the distance being 6 furlongs.

6. Right of way to the Gopalaswami and Thadaganachi Amman Koil situated on Thadaganachi hill south-east of Kottur, Pollachi taluk (III—2 and 3). This path enters the Anamalai reserve between cairns 474 and 475 on the west side of survey field No. 221 of Thoravur village and runs south-east passing along Gopalaswami Koil and Vengaipetti to Thadaganachi Amman Koil, the distance being about 4 miles. The right to use the path throughout the year is subject to the restrictions that fires shall only be kindled in the places set apart on the hills for that purpose by the Forest Department, and that no fire should be carried along this path.

7. *Right of way to Thadaganachi Amman and Gopalaswami Koils, Pollachi taluk (II-2 and 3).*—The claim to right of way over the Kundruttithadam is granted to the people of Jallipatti to go to Thadaganachi Amman and Gopalaswami koils on Thadaganachi Malai subject to the restrictions given in the above item. The path enters the Anamalai reserve between cairns Nos. 490 and 491 on the southern side of Survey No. 420 of Jallipatti village and runs along the Kundruttipallam and meets the path in item (11-13) above west of Vengaipatti. The distance of the path is about 1-1/2 miles.

8. *Right of way over Nuthipallathadam to Thadaganachi Amman Koil (Item No. III-3).*—The claim to the right of way to Thadaganachi Amman Koil is granted to the ryots of Arthanaripalayam by the path now ordinaraily used for that purpose, provided that they do not kindle fires except in the places selected for that purpose by the Forest Department and that no fire is carried along the path. The path enters the Anamalai reserve between cairns Nos. 528 and 529 at the southern side of Survey No. 188 of Arthanaripalaiyam village and runs in a south-easterly direction up to the jungle stream for about one mile, and then turns west and goes to Thadaganachi Amman Koil. The total distance of the path is about 2 miles.

9. *Right of way to the Gopalaswami and Thadaganachi Amman Koil on the Thadaganachi hill from Paruthiyur.*—The right of way over the path to the temples is given to the ryots of Paruthiyur subject to the restrictions that no fire shall be kindled within the reserve except in the place set apart for that purpose by the Forest Department. It enters the Anamalai reserve between cairns Nos. 586 and 587 on the western side of survey No. 430 of the same village. It re-enters the reserve after crossing and re-crossing the Nallar river about a furlong north-west passing along Puliampatti, Sallemorapatti, Setpati, to clinometric point 3621 where it meets the path in item No. II-13. The distance of the path is about 4 miles.

10. *Right of way from Dhali to Ponnalamman temple* (III-4).—Right of way over the path to Ponnalamman temple is granted to the public. Cooking will not be permitted here or kindling of fires. This may be done, however, outside the reserve limits a few yards off. The inhabitants, Malasars and Pulayars of Kil-Kurumalaipatti, are permitted to use the path.

The path enters the Anamalai reserve at the west side of Survey No. 904 of Dhali village between cairns Nos. 145 and 146 and runs in a south-westerly direction for a few yards to the temple.

11. *Right of way from Dhali to Tirumurthi temple (III-5).*—The claim to right of way over the path to Tirumurthi koil is granted to all persons desirous of visiting the temple.

The path enters the Anamalai reserve between cairns Nos. 222 and 223 at the south-side of Survey field No. 331 at Dhali village and runs in a southerly direction for about two furlongs to the temple.

12. *Right of way to Tirumurthi Koil to go to and come from the bathing place at Panchalingam about half a mile up the river above the Koil.*—In continuation of the path above (II-18), right of way is given to go and come from the bathing place at Panchalingam. The distance is about half a mile up the river from Tirumurthi Koil.

13. *Right of way from Dhali to Mamangathamman Koil (III-7), Udumalpet taluk.*—Path in question is a continuation of the path in item (II-18) supra and it runs south for about 1-1/2 miles along the path to Kurumalai used by hill tribes and after crossing a tributary of the Palar, it ends at Mamangathamman Koil.

14. *Right of way from Delhi to Bodinayakkan Koil (III-7), Udumalpet taluk.*—Right of way to Bodinayakkan Koil is given to the public. The part enters the Anamalai reserve between cairns Nos. 262 and 263 at the south-east corner of field No. 344 of Jallipatti village and runs for about 2 miles in a southerly direction to the *Koil.*

15. ***Right of way to the temple of Yelumalayan Venkatachalapathy Koil (III-9), Udumalpet taluk.***—The right of way is subject to the following conditions.

(*a*) The path may be used by all classes and castes.

(*b*) The path to be ordinarily used by the public frequenting the *koil* on Saturday except during the month of *Purattasi* (September and October) when it may be used daily.

(*c*) All cooking and lighting of fires for that or any other purpose is to be restricted to the *tope* round the temple or to such other places as may be set apart for that purpose by the District Forest Officer. The path in question enters the Anamalai reserve between cairns Nos. 323 and 324 and it is about one mile west of Jambumalai from field No. 453 of Manupatti village. It runs first southward and then in a slightly south-westerly direction for a distance of about 2½ miles to the *koil*.

16. *Right of way originally admitted from Manupatti village to Kodanthur since converted into a metalled road by the Public Works Department and termed as the Pallapalayam-Chinnar road.*—The road enters the reserve at its sixth mile first furlong on the south side of survey field No. 449 of Manupatti village and runs in a southerly direction as far as the 3/4 milestone. Thence it runs south-west till it meets the southern boundary of the Anamalai reserve. The distance of the road from the reserve boundary as far as it meets the Anamalai reserve is about 9¼ miles. The average width of the road is 66 feet.

17. *Right of way from Kallapuram to Mangipatti of Madurai district to Anjanad in the Travancore territory or to Arikampatti of the Coimbatore District, Udumalpet taluk.*—The claim to right of way over the path is given to the public, to merchants, to Pulayars of Thalinji and all others desirous of proceeding over the path until it enters the Amaravathi reserve. At the time of settlement, the portion of the right of way as far as it lies in Anamalai reserve was a path only and subsequently this has been converted into a road by the Forest Department.

It enters the reserve at Trignometrical point 1124 just to the east of cairn No. 458 and runs in a south-westerly direction for about three and a half miles through the reserve and enters the Amaravathi reserve near the Anicut on the Amaravathi river whence Krishnier's channel starts.

18. *Right of way to Mukundappar Koil (III-10).*—The path enters the Anamalai reserved forest just near cairn No. 474 on the south side of Survey field No. 448 of Kalla puram village and runs southwards to the above temple. The distance of the path is about four miles.

19. *The ghat road.*—The ghat road enters 'Andiparai' or 'Mary Estate' on its northern boundary, a couple of yards south of the stone marking the trijunction of the Waverly Estate. Anamalai Reserved Forest No. IV of this block runs south-west for a distance of about 5 chains, thence runs due south through the cultivated portion of the estate within the reserve until it reaches its southern limits when it runs south-east for a distant of about 5 chains, then going north-east for a distance of about 8 chains when it runs south-east until it leaves the estate crossing the boundary a couple of chains south of the first stone south of the southern most limit of the Nesbit Estate. Width 14 feet exclusive of side drains and is open for men, cattle and carts.

20. *The bridle path.*—It enters the 'Andiparai' or 'Mary Estate' from the Waterfall Estate about 13½ chains north-west of the point of trijunction of the Waterfall and Nesbit Estates with this block runs first due west and then due south when it enters the cultivated portion of the area and then north-west where it joins the ghat road. It leaves the ghat road at the point where the road runs south-east and then west and then south-east until it touches the eastern boundary of the reserve; then it runs along the boundary until it touches the eastern boundary of the reserve; thence it runs along the boundary for about 15 yards, turns south-west, east and south and leaves the block about 20 chains south of the point of exit of the ghat road in item No. 26. Width, 6 feet and is open for men and cattle.

The following temples with the space specified round each of them for purposes of worship are excluded from reservation and retained as enclosures within the Anamalai reserve with access as provided under each :—

1. *Malai Perumalswami Koil.*—The temple is situated about a furlong south of survey field No. 1026 of Vettaikaranpudur village and consists only of a stone under a tree.

No fire is to be lighted at the temple for cooking or for any other purpose. An area of two acres round the temple will be allotted for the use of the pilgrims. Access to the *koil* will be by right of way No. II-1.

2. *Gopalaswami Koil.*—The temple is situated within the Anamalai reserve about three furlongs south of survey field Nos. 445 and 444 of Jallipatti village. An area of two acres round the temple will be set apart for use of the pilgrims. Access to the *koil* will be by rights of way Nos. II-13, 14, 15 and 16.

3. *Thadaganchi Amman Koil.*—The temple is situated within the Anamalai reserve about two furlongs south of Thadaganachimalai. An area of ten acres round the temple will be set apart for use of the pilgrims. Access to the *koil* will be by rights of way Nos. II-13, 14, 14, 15 and 16.

4. *Ponnalamman temple.*—The temple is situated some few yards within the Anamalai reserve boundary in the neighbourhood of survey field No. 904 of Dhali village. Cooking will not be permitted here or kindling of fire. This may be done however outside the reserve limits a few yards off. An extent of one acre round the temple will be set apart for the use of pilgrims. Access to the temple will be by right of way No. II-7.

5. *Tirumurthi temple and Panchalingam.*—The Tirumurthi temple is situated within the Anamalai reserve in the bed of the Palar river about two furlongs to the south side of survey field No. 325 of Dhali village. Fires may be kindled and cooking performed at the temple subject to the restriction that no cooking is to be carried on except in the space provided for that purpose. Access to the temple will be by right of way No. II-18.

6. *Panchalingam.*—This is situated in the Anamalai reserve about half a mile up the Palar river from Tirumurthi temple. No fire is to be kindled at the bathing place. An area of 50 acres round the Tirumurthi temple and Panchalingam will be set apart for use of pilgrims. Access to the temple will be by right of way No. II-19.

7. *Manangathamman Koil.*—This is situated about one and a half miles south of Tirumurthi temple within the Anamalai reserve. No fire shall be kindled or cooking performed at the temple itself. The people will therefore have to cook food at the place provided at Tirumurthi and carried thence to the temple. An extent of one acre round the temple will be set apart for use of pilgrims. Access to the temple will be by right of way No. II-20

8. *Bodinayakkan Koil.*—The *koil* is situated within the Anamalai reserve about two miles south of survey field No. 344 of Jallipatti village. No fire may be kindled nor cooking carried on in the neighbourhood of this *koil*. This must be done outside the reserve or in the space allotted for the purpose. An extent of one acre round the temple will be set apart for use of pilgrims. Access to the *koil* will be by right of way No. II-21.

9. *Yelumalayan Venkatachalapathi Koil.*—The *koil* is situated about two and a half miles within the Anamalai reserve to the south side of survey field No. 453 of Manupatti village. An area of 100 acres round the temple will be set apart for use of pilgrims. Thirty cattle are permitted free grazing. All cooking and lighting of fires for that or any other purpose is to be restricted to this area round the *koil*. Access to the *koil* will be right of way No. II-22.

10. *Mukundappar Koil.*—This is situated within the Anamalai reserve near its south-west corner about four miles south of survey field No. 448 of Kallapuram village. An extent of one acre around the temple will be set apart for the use of pilgrims. Access to the *koil* will be by right of way No. II-25.

11. *Avarakodipallam Temple.*—There is a shrine in the Avarakodipallam addition. Right to worship at this temple and within a space of 25 yards square round it and a right of way thereto by a path to the field already admitted at settlement have not been admitted.

12. *Kamatchi Amman Koil.*—Right to worship at this temple situated near the 17th mile stone on the Anamalai ghat road. All acts incidental to the worship will be allowed within the area, viz., 0.12 acre. Access to the temple is by the Pollachi—Anamalai Ghat road.

13. *Athaliamman Koil.*—Right to worship at this *koil* situated about 440 yards north-east of the first mile stone on the Anamalai Ghat road. All acts incidental to the worship will be allowed within the two areas of 0.25 acre and 3.25 acres. The area of 0.25 acre is used by the pilgrims for cooking :—

Right of way for men only over the path described below leading to the above temple is admitted.

The path branches off from the Anamalai Ghat Road at one chain north-east of the sixth furlong of the first mile and runs south-east for a distance of one and a half miles. Its width is 30 feet.

14. *Kannimar Amman Koil.*—Right to worship at this temple situated on the left bank of the Puliampatti Ar at eight and a half chains east of its junction with the Avarakodipallam stream. All acts incidental to the worship will be allowed within the area. The area of the plot of land is 0.4 acre and it is situated on the left bank of the Puliampatti Ar.

Right of way for men only over the path, described below leading to the temple is admitted. The path branches off from the right of way No. 9, at a point about 26 chains south-west of cairn No. 617 and runs south-west for a distance of 8.04 chains to the Puliampatti Ar through the temple. Its width is 30 feet.

Right to collect minor forest produce in Anamalai Reserve admitted at the time of Forest Settlement.

1. *Right to collect minor forest produce, such as gallnuts, deer horns, honey and wax within the Anamalai reserve during the months of Masi and Pangunni (February and April) and Audi (July and August) claimed at the time of forest settlement by Rakkan Mundayan and Kuppan and the other five Malasar families living at Kombuparai, hamlet of Kallapuram village, Udumalpet taluk.*—The claim to right to collect the minor forest produce mentioned above is admitted provided always that all such produce collected by the claimants shall be sold to the District Forest Officer or his nominee for cash or barter for goods.

2. *Claim to continue to exercise the privilege in Anamalai reserve of gathering minor forest produce such as honey, bees-wax, gallnut and horns for barter with the forest contractor by receiving from the latter, grain, salt, tamarind and clothes (claims at the time of forest settlement by Kabilappan Muduvar living at the Kil Kurumalai and eight other Muduvars and twenty Pulayars all of same place Udumalpet taluk).*—The claim is admitted together with jungle produce for disposal to the Government forest contractor for barter along and subject to the provisions of paragraph 9 of G.O. No. 1612, Revenue, dated 2nd August 1879.

3. *Claim put in at the time of forest settlement by Chinna Kali, headman of Pulayars at Punachi, Pollachi taluk for the right to collect jungle produce among the Anamalai hills.*—The claim to the right to collect minor forest produce is admitted on behalf of the community of Pulayars at Punachi, a place in Anamalai jungle. The time of collection is whenever they wish. The right is subject to the following provisos : The produce must be disposed of to the forest contractor for barter. The recognition of this right does not bar or in any way interfere with the right of the Government, also together with such produce in such manner as they may from time to time decide.

4. *Claim put in at the time of forest settlement by Ponoo, headman of the Kadar tribe community, twenty in number, living in Punachi hill for the right to collect minor forest produce in the Anamalai hills.*—The claim to the right to collect minor forest produce is admitted. The time for collecting the produce collected such as horns, wax, honey and nuts is to be sold or bartered to the Government forest contractor. The admission of this right does not bar the right of Government to deal with the collection and disposal of minor forest produce hereafter, as they may think fit.

5. *Claim for specific rights in the collection of minor forest produce vested in the hill tribes of the Anamalais, viz., Muduvars and Pulayars.*—All the hill tribes of the Anamalais, Pulavars, Malasars, Muduvars and Kadars are hereby allowed to collect minor forest produce, such as horns, honey, wax and nuts, etc., throughout the year all over the Anamalais. All such produce is to be disposed to the Government forest contractors, for money or goods as may be desired. This permission does not bar the rights of Government to hereafter collect and dispose of the minor forest produce as may seem good to them.

I

Private channels and anicuts.

1. *Anicut No. 1 opened by Sellappa Kavundan.*—This is built across the Chinnar river in Anamalai reserve about 3·70 chains south of cairn No. 239 in Kottur village of Pollachi taluk. The anicut is 383 feet long of which 300 feet is built of rough stone in cement and is of 4 feet 8 inches broad and 8 feet high. The remaining 83 feet is of boulder stones heaped up to a width of 3 feet and to a depth of 3 feet and earth being spread on the top and inside the stone work to prevent leaking.

2. *Channel No. 1 owned by Sellappa Kavundan*—A channel starts from the above anicut on the left arm of the Chinnar river, runs through the Anamalai reserve in a northerly direction for about 3·70 chains and leaves the reserve at about cairn No. 239. It re-enters the reserve at about cairn No. 238, runs north-west through the said reserve by the side of the reserve boundary line as far as cairn No. 236 and eventually leaves the reserve at the last named point at about the south corner of survey field No. 1479 of Kottur village, Pollachi taluk. The total length of this channel so far as it lies in the Anamalai reserve is about 13·70 chains.

3. *Branch channel.*—Another channel branches from the above private channel at about one and half chains south of cairn No. 239, runs in a northerly direction and leaves the Anamalai reserve at about cairn No. 240 in the south side of survey field No. 1476 of Kottur village. The length of this channel so far as it lies in the Anamalai reserve is about 6 chains.

4. *Anicut No 2 owned by Sellappa Kavundan.*—This is situated in Anamalai reserve, Kottur village in Pollachi taluk. It is built across the same Chinnar river but still lower down. It is about one and half chains to the south of cairn No. 241 and is 66 feet long, 9 feet broad and 3 feet high and consists of rough stone boulders, the interior spaces being filled with earth to prevent leakage.

5. *Channel No. 2 owned by Sellappa Kavundan.*—A small channel runs from the above anicut across the Chinnar river in the Anamalai reserve about one and a half chains to the south of chairn No. 241, runs in a northerly direction and leaves the reserve at cairn No. 241 in the south side of survey field No. 1476 of Kottur village, Pollachi taluk. The length of this channel so far as it lies in Anamalai reserve is about two and a half chains.

6. *Navamulai anicut and channel owned by Saiyid Hasan Sahib of Angalakurichi village.*—The channel starts from the eastern arm of the Aliyar river in Anamalai reserve where an anicut has been built of rough stone across the river at a distance of 29.12 chains to the south-west of cairn No. 324, on the Anamalai reserve boundary line. The anicut

is five chains long, ten feet broad and six feet high. The channel runs from this anicut through the Anamalai reserve forest in a slightly north-easterly direction for a distance of 10·05 chains where it divides itself into two as upper and lower channels.

The upper channel runs through the reserve for a distance of 18·85 chains and leaves the reserve boundary line between cairn Nos. 324 and 325 at a point 330½ and 40 links from cairn No. 325. The lower one runs through the reserve from the point of bifurcation to the reserve boundary for a distance of 19·07 chains and leaves the reserve boundary line between cairn Nos. 323 and 324 at a point which is 180 links from cairn No. 324.

7. *Krishnier's right to maintain private channel constructed by him in Anamalai Reserve.*—A channel taking off from the Government anicut across the eastern arm of the Amaravathi river at Manthorai and running through the Anamalai reserved forest first in a north-westerly direction for 40 chains, thence north-east for 40 chains, thence northwards for 80 chains, thence east almost following the northern boundary of the Anamalai reserve for a distance of three miles of leaving the reserve at the junction of the northern boundary of the said reserve with the southern side of field No. 448 (channel of Kallapuram village).

V

(*a*) *Areas disafforested in Anamalai Reserve and known as the Anamalai Township.*—It is bounded on the north by the Stanmore Estate, on the east by the Puduthottam Estate, on the south by the Castlecroft and Sirukundra Estates and on the west by the Stanmore Anamalai Company's Estate.

N.B.—The Anamalai reserve includes within its limits the Punachi reserve.

Other concessions.

I. Permission is granted to the Executive Engineer, Civil Engineering Division, **Hydro-electric Department**, Madras to enter into and occupy a plot of reserved forest, measuring 4·25 acres in Anamalai reserve, Punachi range, for the purpose of building two lascars' quarters.

Conditions :—

(1) Nobody occupying the lines will be allowed to have fire-arms.

(2) The land is not to be used for other purposes.

(3) The land will be handed back to the Forest Department if no longer required.

(4) The area will be neatly fenced to prevent extension of the land occupied by the lascars.

II. Licences for use of land and water granted to the Anamalai Ropeway Company in G.O. No. 1893, Revenue, dated 20th October 1923.

III. Permission has been granted by the Chief Conservator of Forests to the Resident Engineer, Hydro-electric Department, Pykara Construction Works to do all acts necessary for the maintenance of the hydro-electric power transmission and telephone line from Vannanthorai to Iyerpadi and of the branch telephone line from the main transmission and telephone line to the quarters constructed by the Hydro-electric Department at Attakatti, wherever the line passes through the Anamalai reserved forest. The maximum width for clearing permitted is 50 feet on either side from the centre in the case of the main line and 10 feet on either side from the centre in the case of the branch telephone line. No right to any form of forest produce is conferred by this order, and where any tree growth is cut the fact should be intimated to the District Forest Officer who will take charge of it and effect its disposal.

(C.C.P. Mis. No. 446, dated 10th October 1933).

(b) *Tunacadavu Reserve.*

The following rights of way are admitted through the reserve:

1. *Right of way from Tunacadavu (Mount Stuart) to the Cochin territory in the Anaigundi pass.*—The path runs from Mount Stuart in a Southerly direction (via) the Anaigundi pass and leaves the Coimbatore-Cochin boundary at about one and a half miles south-east of the Vengolimalai (Peak) distance of the path up to the district boundary being about four miles and width 50 feet.

NOTE.—The Nambidi of Kollengode and Government Kadars have sole right of way over the path.

Miscellaneous rights.

2. *As regards the right to collect the minor forest produce in the British portion of the Tunacadavu Reserve.*—No claim to collect or share in the value of the minor forest produce from the Government Reserve was advanced at the time of settlement except by the Kadars whose privilege in this respect are not gainsaid and are fully recognised by Government.

(c) *Kudraiyar Reserved Forests.*—The following rights of way through the reserve are admitted. They are ten yards wide and open for men and cattle.

(1) *Kukkal to Kavalapatti.*—It enters the reserve from the south 15 chains west of the Kudraiyar river and runs generally in a north-easterly direction along the left bank of the Kudraiyar river touching the easternmost corner of S. No. 227 and passing through S. No. 223 of Kukkal village and leaves the reserve at the junction of Mullolodai with the Kudraiyar river.

(2) *Puttur to Kavalpatti via Athivayal.*—It enters the reserve 41 chains east of Chinnavari and runs in a north-easterly direction in a zigzag way passing through S. No. 293 of Kukkal village and leaves the reserve at a point 80 chains west of the junction of the northern boundaries of the Kudraiyar and Oliyanuthu reserve.

(3) *Puttur to Kavalpatti.*—It enters the eastern boundary of the reserve 28 chains north of the south-east corner of Kudraiyar reserve and runs in a northerly direction along the common boundary of the Oliyanuthu and Kudraiyar reserves and leads to the plains at the junction of the northern boundaries of the Kudraiyar and Oliyanuthu reserves.

SPECIFICATION OF PATTA LANDS ADMITTED.

Portions of reserve to be disafforested. (1)	*District.* (2)	*Taluk.* (3)	*Village.* (4)	*Area in acres.* (5)
Survey number 227 of Kudraiyar Reserve.	Madurai.	Kodaikanal.	Kukkal.	1·23
Survey number 228-A to J of Kudraiyar Reserve.	Do.	Do.	Do.	7·77
Survey number 294-A, B and D to F of Kudraiyar Reserve.	Do.	Do.	Do.	5·18
			Total ..	14·18

Boundaries.—Bounded on all sides by reserved forests.

Brief description.—These fields are under cultivation by *pattadars.*

(d) *Manjampatti Reserved Forest.*—The undermentioned rights of way are allowed within the block.

(1) Footpath from Mannavanur to Manjampatti, six feet wide and open for people and cattle. It enters the block near cairn No. 1 and running north-eastward along the boundary leaves it at Kuttuar.

(2) Foot path from Manjampatti to Anjanad, three feet wide and open for people. It enters the block near the point where the path to Thalinji branches from it and runs westwards through the block for about 12 chains.

(3) Foot path from Manjampatti to Kareappanshola, three feet wide and open for people. It enters the block west-south—westwards through the block for about 32 chains.

(c) *Amaravathi Reserved Forest.*

Kattilaparamman Koil—Right to worship at this *koil* situated on the left bank of the Chinnar river at a distance of 1 mile 3 furlongs and 1.29 chains up the river from the bridge by which the Udumalpet—Munnar road crosses the Chinnar river. All acts incidental to worship will be allowed within the pool, the area of which is 2.50 acres. Access to it is allowed by a path which leaves the Udumalpet-Munnar road at a point 4.74 chains of the northern edge of the Chinnar bridge, runs generally west and almost parallel to the left bank of the Chinnar river for a distance of 1 mile 3 furlongs and 1.29 chains and enters the temple area on its east side at a point 50 links north of its south-east corner. The path is open to the general public and is 30 feet wide throughout.

(d) *Uthiyur Reserved Forest.*

I. The following *patta* holdings are excluded from reservation and left as an enclosure within the block with access by right of way No. (1) in IV :—

Survey numbers.	*Extent* ACRES.
828 (b)	1.54
828	20.99
839	30.00
831	21.97

II. The following temples have been excluded from reservation and left as enclosures within the block with access as mentioned under each :—

(1) A space of one acre around Uthanda Velayudaswami temple, situated about three quarter furlong north-west of the south-west corner of S. No. 455 with access by rights of way Nos. 455 (6) and (7) in IV.

(2) A space of one acre around Kannimar and Muniappa Koils, situated three quarter furlongs due north of item No. 1 with access by right of way No. (6) in IV.

(3) Velivinayagar koil covering about two cents and situated on the top of the hill about half a furlong north-west of Thambiran cave (item No. 4 infra) with access by right of way No. (7) in IV.

(4) Thambiran cave, covering an area of about ten cents and lying about half a furlong south-west of item No. (1) with access by right of way No. (7) in IV.

(5) A space of one acre around Konganar Koil and a cave called Seddar cave situated fifty yards south-west of the temple, with access by rights of way Nos. (2), (8) and (9) in IV.

(6) A space of one acre around Kannimar and Karuppannan Koils situated south-west of item No. (5) about a furlong north of the path from Uthiyur to Tayampalayam, with access by right of way No. (10).

(7) Idumban and Hanumanthaswami Koils each covering one cent and situated on either side of the steps leading to the big temple (item No. I) with access by right of way No. (7) in IV.

(8) A space of about quarter acre containing two reservoirs south of the flight of steps to the temple at its commencement near the ground; another reservoir north of it which adjoins the step and a Vinayagar Koil between the former two. They will be approached from points in the flight of steps nearest to them.

III. (1) A reservoir covering about quarter acre, situated fifty yards north of item No. (4) in III. To be approached by right of way No. (7) in IV.

(2) The right to the use of the water of well lying south-west of Subbaya Goundan's *patta* lands is allowed for the said pattadar's cattle to be approached by right of way No. (1) in IV.

IV. The following rights of way are allowed :—

1. Cart-track which enters the reserve at the north-west corner of Survey No 1013 of Mudalipalayam and runs north-north-westerly to the well item No. (2) in III and then north-ward to the *patta* land (item 1). It will be twelve feet wide and open for people, cattle and carts.

2. *Path running throughout Survey No. 473, from Kasilingapalayam to Konganar Koil.*—It enters the reserve on the south-side of No. 473 and running generally in a southerly direction leaves on the east side of the said temple. It will be five yards wide and open for people and cattle and for carrying images of horses to the temple.

3. *Path branching from No. (2) to Uthiyur.*—It branches from No. (2) in Survey No. 473 and enters the reserve at the south-east corner of that number, and running easterly south of Survey Nos. 460, 459 and 458 joins path No. (5) at the point where it crosses the south side of Survey No. 458. It will be two yards wide and open for people and cattle.

4. *Branch path from No. (2) to the patta lands west of Survey No. 479 and to Payampalayam.*—It branches from No. (2) in Survey No. 473 and enters the block on its west side of that number and running westerly leaves the reserve on the west side of Survey No. 479 both of Uthiyur. It will be four yards wide and open for people, cattle and carts.

5. *Path from Appipalayam, Sengodampalayam, etc., villages to Uthiyur.*—It enters the forest on the south-side of Survey No. 458 and running south-westerly leaves the block at the south-east corner of the said number; it will be five yards wide and open for people, cattle and carts.

6. *Branch paths from No. (2) to Kannimar, Muniappan and Uthanda Velayudaswami temples.*—It branches from No. (3) at a point south of the Khandem stone on the south side of Survey No. 460 and runs at first south-easterly to Kannimar and Muniappan Koils and then runs southerly along the *odai* to Uthanda Velayudaswami temple. It will be five yards wide as far as the first two temples and open for people, cattle and for carrying images of horses, and two yards wide afterwards and open for people and cattle only.

7. *Path from Uthiyur to Uthanda Velayudaswami Koil and from thence to Thambiran cave and Uchivinayagar Koil.*—It will be three yards wide and open for people and cattle only. It enters the reserve on the west side of Survey No. 455 of Uthiyur and runs to the said places.

8. *Path branching from the junction of Nos. (6) and (7) to the Konganar Koil.*—It runs south-westerly and joins path No. (2) about half a mile north of the said temple. It will be three yards wide and open for people and horses.

9. *Path from Konganar Koil to Kudalipalayam, etc., villages.*—It runs from the temple southwards along the *odai* and leaves the reserve on the northside of survey No. 433 of Uthiyur. It will be three yards wide and open for people and horses.

10. *Path from Kannimar and Karuppannan Koils to the Uthiyur—Tayampalayam path.*—It runs from the temple southwards to the said path. It will be five yards wide and open for people, cattle and carts.

11. *Path to the patta lands, survey Nos. 1064, 1068, 1081, 2074 and 1075 through Survey Nos. 1069, 1070 and 1071.*—It enters the reserve on the east side of Survey No. 1071 and running through Nos. 1071, 1070 and 1069 along their west sides leaves it on the west side of Survey No. 1069 (all of Mudalipalayam). It will be two yards wide and open for people and cattle.

(e) *Dalavoipatnam Reserve Forest.*

1. The patta field Survey No. 368 (acres 15.89) of Dalavoipatnam Village has been excluded from reservation and left as an enclosure within the block. It is to be approached by right of way No. 1 (infra).

2. A *koil* (temple) covering one cent on a rock in Survey No. 367 has been excluded from reservation and left as an enclosure within the block. It is to be approached by right of way No. 4 (infra).

3. The following rights of way have been admitted and recorded :—

(1) A path from Survey No. 371 to Survey No. 341. It enters the forest at the north-west corner of Survey No. 371 and runs along the *odai* through Survey Nos. 369 and 368 to the south-east corner of Survey No. 340; thence along its south side to the south-east corner of Survey No. 341 where it leaves the block. It is required for people and cattle to a width of a twelve feet.

(2) Right of way from Dalavoipatnam to Sinnakampalayam it enters the forest on the south side of Survey No. 366 and running north-westerly leaves the block at the north-west corner of Survey No. 346. It is required for people and cattle to a width of two yards.

(3) *Right of way from Uttupalayam to Sinnakampalayam.*—It enters the forest on the west side of Survey No. 583 and running through that number leaves the block on the north side of the said number at a point one chain east of the south-west corner of Survey No. 586. It again enters the block on the south side of Survey No. 362 and leaves it on the east side of the said number. It enters the block for the third time on the south side of Survey No. 542 and running north-easterly leaves it at the north-east corner of the said number. It enters the block for the last time on the north side of the said number. It is required for people and cattle to a width of two yards except where it runs through survey and demarcated limits of that number.

(4) *Path from item No. 3 to the koil on a rock in Survey No. 367.*—It branches from item No. 3 at a point due south of the south-east corner of survey No. 367 and runs north-westerly to the temple on a rock. It is required for people only to a width of six feet.

(f) *Attamalai Reserve Forest.*

The path in Survey No. 1718 running to the villages in the Palni taluk has been admitted and recorded. It enters the forest near the north-west corner of survey No. 171 and running through the block south-south-easterly, leaves it on the south side of the said number. It will be open for people, cattle and carts to width of four yards.

2. The usufructs of thirteen tamarind trees on the western slopes of the Attamalai has been admitted and recorded, subject to such conditions as may be made by the Governor in council under Section 12 (6) of the Forest Act, provided :—

(1) That no grant, sale, lease, mortgage or other alienation shall be made without the sanction of Government in accordance with section 19.

(2) That no access shall be had to the trees without the permission of the Forest Department except during months of January, February, March and April. for the purpose of collecting fruit.

(3) That access can be had to the trees by a path six feet wide running from the south-west corner of Survey No. 1846, south-easterly through Survey Nos. 1775 and 1774 and thence north-eastwards for about half a mile to the tree and open for people only.

(4) The pattadar is free to sell or barter the produce.

(g) *Periamanimalai Reserve Forest.*

The *itteries* (right of way) comprised in Survey Nos. 996 and 905 are allowed for people, cattle and carts.

APPENDIX IV.

List of teak plantations in the Coimbatore South Forest Division.

Year of planting. (1)		*Compartments in which the plantation occurs.* (2)	*Gross area in hectares.* (3)	*Net area in hectares.* (4)	*Remarks.* (5)
1872		Mount Stuart 73	2·43	2·43	..
1890		Mount Stuart 63	2·43	0·76	..
1900		Mount Stuart 63	0·81	0·53	..
1927		Mount Stuart 61, 62	59·23	30·76	..
1928	Bit I	Mount Stuart 64, 65	29·76	18·01	..
	Bit II	Mount Stuart 66, 68, 69	21.85	4·82	..
1929	Bit I	Mount Stuart 69, 72	16·19	10·00	..
	Bit II	Mount Stuart 71, 72	44·92	32·17	..
1930	Bit I	Mount Stuart 73	25·39	18·42	..
	Bit II	Mount Stuart 53, 72	13·43	9·23	..
	Bit III	Mount Stuart 72, 73	7·20	3·95	..
	Bit IV	Mount Stuart 72	12·42	9·47	..
	Bit V	Mount Stuart 75	27·84	8·65	..
1931		Mount Stuart 53	33·17	29·95	..
1932		Mount Stuart 74, 75	36.06	23·96	..
1934		Mount Stuart 53, 75	32·17	30·27	..
1934	(P·S. plantation)	Mount Stuart 65	1·62	0·26	..
1935		Mount Stuart 52, 53	20·17	16·49	..
1935	(Bungalow plantation)	Mount Stuart 63	2·02	0·77	..
1936	(P.S. plantation)	Mount Stuart 65	2·02	2·02	..
1937	(P.S. plantation)	Mount Stuart 65	2·02	0·55	..
1957		Ulandi 81, 82	33·99	..	..
1958		Ulandi 82	35·21	..	..
1959		Ulandi 82, 83	25·50	..	..
1960		Ulandi 82, 83, 85	72·84	..	..
1961		Ulandi 83, 85	82·96	..	..
1962		Ulandi 83, 85, 86	81·34	..	..
1963		Ulandi 82, 83, 84, 85	79·32	..	..
1964		Ulandi 81, 82, 84, 87	95·51	..	..
1932		Palakadavu 92	1·13	..	..
1933		Palakadavu 93	11·01	..	The areas of the plantations noted in the Palakadavu Block represent the actual area existing in the field after clearfelling portions submergible in the Parambikulam Reservoir.
1934		Palakadavu 93, 94	9.23	..	..
1935		Palakadavu 96	10·20	..	..
1936		Palakadavu 96	15·54	..	..
1937		Palakadavu 96	8·58	..	..
1938		Palakadavu 96, 98	14·57	..	..

APPENDIX—IV—*cont.*

LIST OF TEAK PLANTATIONS IN THE COIMBATORE SOUTH FOREST DIVISION.

Year of planting. (1)	*Compartments in which the plantaion occurs.* (2)	*Gross area in hectares.* (3)	*Net area in hectares.* (4)	*Remarks.* (5)
1939	Palakadavu 96, 98	18·13	..	..
1936	Punachi 5	10·93	..	..
1937	Punachi 5	9.25	..	..
1938	Punachi 5, 9	8·80	..	..
1939	Punachi 8	11.13	..	..
1940	Punachi 8	9·71	..	..
1941	Punachi 8	13·76	..	..
1942	Punachi 9	9·31	..	..
1943	Punachi 9	13.46	..	..
1944	Punachi 9	10·93	..	..
1945	Punachi 5	5·06	..	..
1946	Punachi 9	13·56	..	..
1947	Punachi 13	13·46	..	..
1948	Punachi 13	11·13	..	..
1949	Punachi 7	9·31	..	..
1950	Punachi 7	10·72	..	..
1957	Punachi 6	23·47	..	..
1958	Punachi 6	19·83	..	..
1959	Punachi 6	22·26	..	..
1960	Punachi 3, 4	21·85	..	..
1961	Punachi 3, 4	19·71	..	..
1962	Punachi 2, 3, 4	19·83	..	..
1963	Punachi 2, 3	18·21	..	..

APPENDIX V.

List of herbs, shrubs and trees commonly found in the Coimbatore South Forest Division.

Botanical name	*Tamil name*
Abrus precatorius	Gundumani
Abutilon indicum	Thuthi
Acacia arabica	Karuvelam
Acacia ferruginea	Shekoy
Acacia concinna	Parambai
Acacia intsia	Indu
Acacia latronum	Vaithuvelan
Acacia leucophloea	Velvelam
Acacia mearnsii	Seekai
Acacia pennata	Vella indu
Acacia planifrons	Seethai
Acacia suma	Othalai
Acacia sundra	Karungali
Acalypha fruticosa	Cinni
Acrocarpus fraximifolius	Malankonnai
Acronychia pedunculata	Vidukanalai
Actinodaphne hookeri	Thali
Adina cordifolia	Manjakadambai
Aegeratum conyzoides	Kattu samanthi
Aegle marmelos	Vilvam
Aerva lanata	Poolai
Agave americana	Kathalai
Aglaia roxburghiana	Chokla
Agrostistachys longifolia	Manikulukki
Ailanthus excelsa	Peemaram
Ailanthus triphysa	Mattipal
Alangium salvifolium	Alingi
Albizzia amara	Usil
Albizzia lebbek	Vagai
Albizzia odoratissima	Karuvagai
Albizzia procera	Velvagai
Allophyllus cobbe	Perrakudikai
Alsophila latebrosa	...
Alstonia scholaris	Ezhilaipalai
Anaphalis lawii	...
Anogeissus latifolia	Vellanagai
Anona squamosa	Sithapazham
Anthocephalus cadamba	Vellai kadambu
Antiaris toxicaria	Maravuri
Antidesma diandrum	Asaripuli
Aporosa lindleyana	Vitti
Ardisia solanacea	...
Arenga wightii	Alampanai
Argyreia cuneata	...
Arisaema leschenaultii	...
Aristolochia roxburghiana	Garudakodi
Artocarpus hirsuta	Ainipila
Artocarpus heterophyllus	Pila
Asparagus racemosus	Thavuttukodi
Atalantia monophylla	Kattu elimichai
Azadirachta indica	Vembu
Baccaurea courtallensis	Thonthi

APPENDIX V—*cont.*

List of herbs, shrubs and trees commonly found in the Coimbatore South Forest Division.

Botanical name.	*Tamil name.*
Barleria species	Kanakambaram
Bauhinia malabarica	Vellathi
Bauhinia purpurea	Mandarai
Bauhinia racemosa	Athi
Bauhinia vahlii	Kattu mandarai
Beilschmiedia bourdilloni	...
Berberis tinctoria	...
Bischofia javanica	Sholavengai
Boucerosia umbellata	Satharakalli
Buchanania lanzan	Saraiparuppu
Bridelia retusa	Mulvengai
Butea monosperma	Elaiporasu
Butea parviflora	Kattu avaraikodi
Calamus pseudotenius	Chinna perambu
Calamus rheedii	Kattu perambu
Calamus travancoricus	Man-perambu
Calanthe veratrifolia	...
Callicarpa lanata	Vettilai pattai
Calophyllum elatum	Kattupinnai
Calotropis gigantea	Erukku
Calycopteris floribunda	Pillani
Canarium strictum	Karunkungiliam
Canthium dicoccum	Nekkini
Canthium parviflorum	Karai
Capparis decidua	...
Capparis zeylanica	Athondai
Carallia brachiata	Andimirian
Cardiospermum helicacabum	Modakethan
Careya arborea	Ayma
Carissa carandas	Kilakkai
Caryota urens	Koonthapanai
Casaeria tomentosa	...
Cassia auriculata	Avaram
Cassia fistula	Konnai
Cassia montana	Malayavaram
Cassia siamea	Manjakonnai
Cassia tora	Thagarai
Cedrela toona	Santhanavembu
Ceipa pentandra	Ilavan
Chloroxylon swietenia	Porasu
Chomelia asiatica	Pavattai
Chukrasia tabularis	Madagirivembu
Cinnamomum sulphuratum	...
Cinnamomum wightii	Vettadu
Cinnamomum zeylanicum	Lavangam
Cipadessa baccifera	Savuttu chedi
Cissus quadrangularis	Perandai
Clausena dentata	Kattu Karuveppillai
Cleistanthus collinus	Oduvan
Clerodendron viscosum	Perungilai
Cochlospermum religiosum	Thanakku
Commiphora berryi	Mulkiluvai
Commiphora mukul	Pachakiluvai
Cordia dichotoma	Naruveli

List of herbs, shrubs and trees commonly found in the Coimbatore South Forest Division.

Botanical name		*Tamil name*
Crataeva religiosa	...	Mavalingam
Croton oblongifolius	...	Milagunari
Croton malabaricum	...	Thavattupolavu
Cryptolepis buchanani	...	...
Cullenia rosayroana	...	Korangu pila
Cupressus macrocarpa	...	...
Curcuma angustifolia	...	Kattukuvai
Curcuma aromatica	...	Kasthurimanjal
Curcuma longa	...	Manjal
Cycas circinalis	...	Kodi icham
Cyperus rotundus	...	Korai
Cytissus scoparius	..	...
Dalbergia latifolia	...	Itti
Dalbergia paniculata	...	Pachalai
Dalbergia sissoides	...	Itti
Dalbergia sissoo	..	Sissoo
Datura metel	...	Veloomathu
Dendrophthoe species	..	Pulluruvi
Derris scandens	...	Yanaikellikodi
Desmodium pulchellum	...	...
Dichrostachys cinerea	...	Vedathalam
Dioscorea species	...	...
Diospyros ebenum	...	Karunthovarai
Diospyros melanoxylon	...	Thovarai
Diospyros microphylla	...	Chinna thovarai
Diospyros montana	...	Vakkanai
Dodonaea viscosa	...	Virali
Dolichandrone atrovirens	...	Pumpadri
Donella roxburghii	..	Kattu iluppai
Drypetus macrophylla	...	...
Dysoxylum malabaricum	...	Vellagil
Elaeagnus kologa	..	...
Elaeagnus latifolia	...	Kulangi
Elaeocarpus munroii	...	Kalbikki
Elaeocarpus serratus	...	Karai
Elaeocarpus tuberculatus	...	Rudraksham
Elaeodendron glaucum	...	Kannirmaram
Elettaria cardamomum	...	Elakkai
Emblica officinalis	...	Nelli
Entada phaseoloides	...	Irikki
Erythrina variegata	...	Murukku
Erythroxylon monogynum	...	Sembulichan
Eucalyptus citriodora	...	...
Eucalyptus globulus	...	Nilagiri maram
Eucalyptus grandis	...	...
Eucalyptus hybrid	..	...
Eucalyptus robusta	...	...
Eupatorium odoratum		...
Euphoria longana		Shempuvan
Euphorbia antiquorum	...	Kalli
Euphorbia hirta	...	...
Euonymus crenulatus	...	...
Eurya japonica	...	...
Evodia lunu-ankenda	..	**Kambili**

List of herbs, shrubs and trees commonly found in the Coimbatore South Forest Division.

Botanical name	*Tamil Nadu.*
Feronia limonia	Vilamaram
Ficus benghalensis	Alamaram
Ficus glomerata	Athi
Ficus hispida	Chona athi
Ficus religiosa	Arasamaram
Filicium decepiens	Athadali
Fimbristylis uliginosa	...
Flacourtia indica	Kattukala
Flacourtia jangomas	Mullumukanchi
Garcinia cambogia	Kodukapuli
Garcinia echinocarpa	Kambilipisini
Garcinia morella	Makki
Garcinia talbottii	Kodukkapuli
Garcinia xanthochymus	Malaipuli
Gardenia gummifera	Dekkamalli
Gardenia turgida	Kambili
Garuga pinnata	Arunelli
Gaultheria fragrantissima	Kolakkai
Girardinia leschenaultiana	Poonai Miratti
Givottia rottleriformis	Boothalai
Glochidion malabaricum	...
Gloriosa superba	Kalappakizhangu
Glycosmis pentaphylla	Kulapanai
Gmelina arborea	Kumil
Gmelina asiatica	Vella kumil
Gnetum scandens	...
Gomphandra polymorpha	...
Gordonia obtusa	...
Grewia tiliaefolia	Thadasu
Guazuma tomentosa	Thenmaram
Gymnema montanum	Mahali kizhangu
Gymnosporia montana	Kattangi
Gyrocarpus jacquinii	Kongelavam or Thanakku
Haeckeria subpeltata	...
Hardwickia binata	Achan
Helicteres isora	Valambiri
Hemidesmus indicus	Nannari
Heritiera papilio	Chatanangu
Hippocratea indica	Odankodi
Hiptage benghalensis	Vennalankodi
Holigarna grahamii	Cheru
Holeptelea integrifolia	Aya
Hopea parviflora	Irumbogam
Humboldtia species	...
Hydnocarpus laurifolia	Maravetti
Hydnocarus alpina	Maravetti
Hymenodictyon excelsum	Malai thanakku
Hypericum mysorense	...
Ichnocarpus frutescens	Oothalkodi
Ilex denticulata	...
Ipomaen species	Krishnakranthi
Ixora arborea	Sulundu
Jatropha curcas	Kattamanakku
Jatropha glandulifera	Adalai

List of herbs, shrubs and trees commonly found in the Coimbatore South Forest Division.

Botanical name	*Tamil* **name**
Kingiodendron pinnatum	Kolavu
Knema attenuata	Pulluruvi
Lagerstroemia speciosa	Pumarathu
Lagerstroemia lanceolata	Venthekku
Lannea coromandelica	Odiyamaram
Lansium anamalayanum	Santhana viri
Lantana camara	Puchedi
Laportea crenulata	Yanai miratti
Lasianthus coffeoides	...
Lasianthus venulosus	...
Lawsonia inermis	**Mamaram**
Leea indica	**Nekku**
Leucas aspera	Thumbai
Leucas suffruticosa	...
Litsea oleoides	...
Litsea stocksii	...
Lobelia nicotinifolia	...
Macaranga peltata	**Vattai**
Machilus macrantha	**Kolamavu**
Madhuca indica	Iluppai
Mahonia leschenaultii	Mullu kadambu
Mallotus philippinensis	Kamala
Mangifera indica	Mamaram
Mappia tomentosa	Shenbagam
Marsdenia volubilis	Kurincha
Melia dubia	**Malavembu**
Meliosma arnottiana	Hulimakai
Meliosma wightii	Tode
Mesua ferrea	Churuli
Michelia nilagirica	**Kattu shenbagam**
Mimosa pudica	Thottal surungi
Mitragyna parvifolia	**Neerkadambai**
Moghania macrophylla	...
Morinda tinctoria	Nona
Morinda oleifera	Murungai
Mundulea sericea	Pullavaram
Murraya koenigii	Karuveppilai
Murraya paniculata	Kattu karuveppilai
Musa species	**Kalvazhai**
Mussaenda frondosa	...
Nerium indicum	Arali
Nothapodytes foetida	Arali
Nothopegia colebrookiana	Sorapalai
Ocimum kilimandscharicum	Thulasi
Olea dioica	Idalai
Oldenlandia articularia	...
Oldenlandia stylosa	...
Opuntia dillenii	Sappathikalli
Orophea zeylanica	...
Osbeckia wightiana	...
Palaquium ellipticum	Pali
Pandanus furcatus	Thazhai
Pavetta indica	Pavattai
Pavonia zeylanica	Kurundoti
Phoenix acaulis	Eacham

List of herbs, shrubs and trees commonly found in the Coimbatore South Forest Division.

Botanical name	*Tamil name*
Photinia notoniana	...
Pinanga dicksonii	Kanakamuku
Piper longum	Milagu
Pithecolobium dulce	Konapuliyan
Pithecolobium subcoriaceum	Mazhvagai
Prosorus indicus	Vayal
Polyalthia coffeoides	Nedunarai
Polyalthia fragrans	Nedunarai
Polygonum **species**	...
Pongamia pinnata	Pungam
Premna integrifolia	Minnai
Premna tomentosa	Kolakattai thekku
Prosopis julieflora	Seemai vanni
Prosorus indicus	...
Protium caudatum	Malankiluvai
Pterocarpus marsupium	Vengai.
Pterospermum hyneanum	Polavu
Pterospermum rubiginosum	Chinna polavu
Pygeum wightianum	Attanari kongu
Radermachera xylocarpa	Pathiri
Randia dumetorum	Karai
Randia uliginosa	Vagatta
Rhamnus wightii	Peypulla
Rhododendron arboreum	Pumaram
Rhodomyrtus tomentosa	Thavattu koyya
Rouwolfia serpentina	Sarpagandhi
Rubus ellipticus	...
Rubus lasiocarpus	Kolalindu
Rubus moluccanus	...
Rubus racemosus	...
Rumex species	...
Saccopetalum tomentosum	...
Salmalia insignis	Poola
Salmalia malabarica	Poola
Santalum album	Santhanam
Sapindus emarginatus	Poochakottai
Schefflera racemosa	Kanneermaram
Schleichera oleosa	Poovathi
Securinega leucopyrus	Veppula
Securinega virosa	Veppulathi
Semecarpus anacardium	Shenkottai
Shorea talura	Jalari
Solanum pubescens	Sundai
Solanum trilobatum	Sundakkai
Solanum xanthocarpum	Kandamkathiri
Spathodea campanulata	...
Spondias pinnata	Mampulichi
Sterculia alata	Anaithondi
Sterculia villosa	Anaikattinar
Stereospermum personatum	Pupadiri
Streblus asper	Kuttipila
Strobilanthes barbatus	Kurinji
Strobilanthes kunthianus	...
Strobilanthes perfoliatus	Kurinji

List of herbs, shrubs and trees commonly found in the **Coimbatore South** *Forest Division.*

Botanical name	*Tamil* **name**
Strobilanthes sessilis	...
Strychnos nux-vomica	Thethankottai
Strychnos potatorum	Etti
Swietenia macrophylla	Mahogany
Symplocos laurina	Kamblivetti
Symphyllia mallotiformis	...
Syzygium arnottiana	Naval
Syzygium caryophyllatum	Krambu
Syzygium cumini	Naval
Syzygium gardneri	Naval
Syzygium munroii	Naval
Tabernaemontana coronaria	Nandiavattai
Tabernaemontana hyneanum	...
Tamarindus indica	Puliyamaram
Tectona grandis	Tekku
Tephrosia species	Kolinji
Terminalia arjuna	Nirmathi
Terminalia belerica	Thani
Terminalia chebula	Kadukkai
Terminalia paniculata	Pillamarudu
Terminalia tomentosa	Karumarudu
Ternstroemia gymnanthera	...
Tetrameles nudiflora	Chini
Thespesia populnea	Poovarasu
Toddalia asiatica	Kattumilagu
Trema orientalis	Ambaruthi
Trewia nudiflora	Naikumil
Trichosanthes cucumerina	Peypodal
Tridax procumbens	...
Vateria indica	Vellakungiliam
Vatica chinensis	Adakkapayini
Ventilago madraspatana	Vembadam
Vernonia monosis	Shuthi
Viburnum erubescens	...
Vitex altissima	Mayiladi
Vitex negundo	Nochi
Viscum species	Ottu
Walsura piscida	Valsura
Wendlandia notoniana	Thevarai
Wrightia tinctoria	Palai
Xylia xylocarpa	Irul
Zanthoxylum rhetsa	Kattumurukku
Zingiber officinale	Inji
Zingiber casumunar	Kattumanjal
Zizyphus glabrata	Karikattan
Zizyphus mauratiana	Elandai
Zizyphus denoplia	Churimullu
Zizyphus xylopyrus	Kottai elandai

APPENDIX VI.

List of grasses commonly found in the Coimbatore South Forest Division.

Botanical name.	*Tamil name.*
Aristida depressa	Oosipullu
Aristida hyotrix	Oosipullu
Bambusa arundinacea	Perumungil
Bothriochloa pertusa	Chinnakaraipullu
Brachiaria distachia	Murugullu pullu
Brachiaria remota	Puliyampullu
Cenchrus ciliaris	Kolakottai pullu
Chloris polystachya	...
Chrysopogon flexuosus	Vasanai pullu
Cymbopogon nardus	...
Cynodon dactylon	Arugam pullu
Dacyloctenium aegyptium	...
Dendrocalamus strictus	Kalmungil
Eragrostis bifaria	Seranaipullu
Eragrostis nigra	...
Heteropogon contortus	Oosipullu
Ischaemum indicum	...
Imperata cylindrica	Tharbai pullu
Indocalamus wightianus	...
Ochlandra scriptoria	Odai
Ochlandra travancorica	Itakalli
Ochlandra wightii	Ita
Panicum trypheron	...
Sehima nervosum	Kura itti
Setaria pallidifusca	Korai pullu
Sporobolus species	...
Teinostachyum beddomei	...
Themeda cymbaria	Nanyura
Tripsacum luxum	Noshia palai pullu

APPENDIX VII.

CONTROL FORMS.

CONTROL BOOK FOR THE TEAK PLANTATION WORKING CIRCLE.

Prescriptions of the working plan.						Operations carried out.									
(1) **Year.**	(2) Name of felling series.	(3) Coupe number.	(4) **Area in hectares.**	(5) System of felling.	(6) Number of exploitable trees (**by species**).	(7) Year.	(8) Name of felling series.	(9) Coupe number.	(10) Surveyed **area of coupe in hectares.**	(11) Nature of fellings.	(12) Number of trees marked (by species).	(13) Yield of timber in cubic **metres** (by species).	(14) **Yield of firewood in metric tonnes.**	(15) **Revenue realised.**	(16) **Remarks.**

CONTROL BOOK FOR EVERGREEN SELECTION WORKING CIRCLE.

Prescriptions of the working plan.							Operations carried out.									
(1) Year.	**(2) Name of felling series.**	(3) Coupe number.	**(4) Area** in hectares.	(5) System of felling.	(6) Number of exploitable trees (by species).	(7) Estimated yield of timber in cubic metres (by species).	**(8) Year.**	**(9) Name of felling** series.	(10) Coupe number.	(11) Surveyed area of coupe in **hectares.**	(12) Nature of felling.	(13) Number of trees marked (by species).	**(14) Yield** of timber in cubic **metres** (by species).	**(15) Yield of firewood** in metric tonnes.	**(16) Revenue realised.**	**(17) Remarks.**

CONTROL BOOK FOR THE FUEL WORKING CIRCLE.

Prescriptions of the working plan.					Operations carried out.								
(1) **Year.**	(2) **Name of felling series.**	(3) Coupe number.	(4) Area in hectares.	(5) System of felling.	(6) Year.	(7) Name of felling series.	(8) Coupe number.	(9) Surveyed area of coupe in hectares.	(10) Nature of fellings.	(11) Total yield.	(12) Revenue realised per hectare.	(13) Gross Revenue.	(14) Particulars regarding 'reserved' trees retained in the coupe (if any).

CONTROL BOOK FOR THE EUCALYPTUS HYBRID WORKING CIRCLE.

Prescriptions of the working plan.					Operations carried out.								
(1) **Year**	(2) Name of felling series.	(3) Coupe number.	(4) Area in hectares.	(5) System of felling.	(6) Year.	(7) Name of felling series.	(8) Coupe number.	(9) Surveyed area of coupe in hectares.	(10) Nature of fellings.	(11) Total yield.	(12) Revenue realised per hectare.	(13) Gross Revenue.	(14) Particulars regarding 'reserved' trees retained in the coupe (if any).

CONTROL BOOK FOR THE IRRIGATED TEAK PLANTATION WORKING CIRCLE.

Prescriptions of the working plan.					Operations carried out.								
Year. (1)	Name of felling series. (2)	Coupe number. (2)	Area in hectares. (4)	System of felling. (5)	Year. (6)	Name of felling series. (7)	Coupe number. (8)	Surveyed area of coupe in hectares. (9)	Nature of fellings. (10)	Total yield. (11)	Revenue realised per hectare. (12)	Gross revenue. (13)	Remarks. (14)

CONTROL BOOK FOR THE BAMBOO WORKING CIRCLE.

Prescriptions of the working plan.						Operations carried out.							
Area. (1)	Name of felling series. (2)	Coupe number. (3)	Gross area in hectares. (4)	System of felling. (5)	Estimated yield in metric tonnes. (6)	Year. (7)	Name of felling series. (8)	Coupe number. (9)	Area actually worked in hectares. (10)	Nature of felling. (11)	Yield. (12)	Revenue realised. (13)	Particulars regarding quantity supplied to paper mill (if any). (14)

CONTROL BOOK FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

Prescriptions of the working plan.					Operations carried out.							
Year. (1)	Name of produce. (2)	Unit of lease. (3)	Period of lease. (4)	Method of working. (5)	Year. (6)	Name of produce. (7)	Unit of lease. (8)	Period of lease. (9)	Method of working. (10)	Yield. (11)	Revenue realised. (12)	**Remarks.** **(13)**

CONTROL BOOK FOR THE SECTION ON GRAZING.

Prescriptions of the working plan.					Operations carried out.									
Year. (1)	**Area opened to grazing.** (2)	Area closed to grazing. (3)	Localities closed to grazing. (4)	Details of penning. (5)	Year. (6)	Area opened to grazing. (7)	Area closed to grazing. (8)	Localities closed to grazing. (9)	Number and description of cattle grazed. (10)	Revenue realised. (11)	**Grazing incidence per cow unit.** **(12)**	**Name of pen.** **(13)**	**Number of cattle licensed to pen.** **(14)**	Remarks. **(15)**

RECORD OF WORKS.

Prescriptions of the working plan.				Operations carried out.					
Year. (1)	Coupe number or locality. (2)	Area in hectares. (3)	Works prescribed. (4)	Year. (5)	Coupe number or locality. (6)	Area in hectares. (7)	Works done. (8)	Expenditure incurred. (9)	Remarks. (10)

REGISTER OF DEVIATIONS.

Year. (1)	Working circle. (2)	Prescription. (3)	Nature of deviation. (4)	Reason for deviation. (5)	Remarks on any possible action to remedy the deviation. (6)	Number and date of order sanctioning the deviation. (7)

CONTROL OF JOURNAL FOR THE TEAK PLANTATION WORKING CIRCLE.

1. *Growing stock*.—Notes on the distribution of various species in the annual coupe.

2. Factors influencing the crop.

(*a*) Climate.
(*b*) Animals.
(*c*) Insects.
(*d*) Fungi.
(*e*) Fire.
(*f*) Man.

3. ***Exploitation.***

(*a*) Notes on the suitability of the present division into felling series.

(*b*) Notes on the suitability of the method of working prescribed.

(*c*) Notes on problems of conversion, dragging and transport of timber.

(*d*) Notes on contractors' and labour supply.

4. *Measures of improvement.*

(*a*) Remarks on the conduct of fire protection operations and their results with suggestions as to possible modifications in lay out.

(*b*) Suggestions for the improvement of communications and export routes.

5. *Artificial regeneration.*

(*a*) Detailed comments on the success or failure of the artificial regeneration measures prescribed with reasons.

(*b*) Suggestions for improvement or modifications of technique.

(*c*) Notes on the relative success attained with each of the secondary species, viz.—*Terminalia tomentosa, Dalbergia latifolia and Eucalyptus grandis* in areas unsuitable for teak.

6. *Subsidiary silvicultural operations.*

(*a*) Notes on the introduction of cover crops—*Ocimum kilimandscharicum*, the technique adopted with suggestions of any change in species and technique.

(*b*) Notes on the weedings and tendings proposed and suggestions to modify them.

(*c*) Notes on the thinnings prescribed and suggestions to modify them.

(*d*) Notes on conversion and sale of thinned produce.

(*e*) Notes on nursery practice—Observation on seeding, germinative power and pre-treatment of seeds. Particular reference should be made on the subject of hybridisation in *Eucalyptus grandis.*

7. *Markets.*

(*a*) Statement on the prices obtained for various timber species, poles and sale of top ends.

(*b*) Notes on the adequacy of provision made for catering to various local markets.

(*c*) Prices of timber of various species in local markets with comments.

8. *Summary of revenue and expenditure.*

A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast made in the working plan.

CONTROL JOURNAL FOR THE EVERGREEN SELECTION WORKING CIRCLE.

1. *Growing stock.*

(a) Notes on the distribution of various species in the annual coupe.

(b) Notes on the relative value of the various timber species extracted.

2. *Factors influencing the crop.*

(a) Climate.

(b) Animals.

(c) Insects.

(d) Fungi.

(e) Fire.

(f) Man.

3. *Exploitation.*

(a) Notes on the suitability of the present division into felling series.

(b) Notes on the suitability of the method of working prescribed.

(c) Notes on problem of conversion, dragging, and transport of timber and sleepers.

(d) Notes on contractors' and labour supply.

4. *Measures of improvement.*

(a) Suggestions for the improvement of communications and export routes.

(b) Results of tending cardamom regeneration in gaps.

5. *Natural regeneration.*

(a) Observations on the extent of natural regeneration of the more valuable species in—

(i) gaps caused by felling, and

(ii) unfelled portions of the coupe.

(b) Notes on tending of natural regeneration in the gaps caused by felling.

(c) Results of tending cardamom regeneration occurring in gaps.

(d) Notes on seeding of the more valuable species, time of seeding, etc.

6. *Markets.*

(a) Statement of prices obtained for supply of sleepers to the Railways and sales of timber and firewood.

(b) Notes on the adequacy of provision made for catering to various local markets.

(c) Comments on the state of the timber market in general and on fluctuations in prices.

7. *Summary of revenue and expenditure.*

A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast made in the working plan.

CONTROL JOURNAL FOR THE FUEL WORKING CIRCLE.

1. *Growing stock.*

Notes on the growing stock, the relative fuel value of various fuel species their distribution in the several felling series, etc.

2. *Factors influencing the crop.*

(a) Climate.

(b) Animals.

(*c*) Insects

(*d*) Fungi.

(*e*) Fire.

(*f*) Man.

3. *Exploitation.*

(*a*) Notes on the suitability of the present division into felling series.

(*b*) Notes on the adequacy of the output of firewood.

(*c*) Notes on the suitability of the rotation and the methods of working prescribed.

(*d*) Notes on contractors' and labour supply.

4. *Measures of improvement.*

(*a*) Remarks on the conduct of fire protection operations and their results, with suggestions as to possible modifications in lay-out.

(*b*) Remarks on the results of closure to grazing with suggestions about possible modifications.

(*c*) Suggestions for the improvement of communications and export routes.

5. *Natural regeneration.*

(*a*) Observations on the seeding of fuel species, time of seeding, etc.

(*d*) Observations on the extent of natural regeneration of various species.

6. *Artificial regeneration.*

(*a*) Detailed comments on the success or failure of the regeneration measures prescribed with reasons.

(*b*) Suggestions for improvement or modifications of technique.

(*c*) Notes on the relative success attained with the various species attempted to be introduced.

(*d*) Notes on the merits of *kumri* cultivation or otherwise with relative merits of the different *kumri* crops.

7. *Subsidiary silvicultural operations.*

(*a*) Notes on the weedings and tendings proposed and suggestions to modify them.

(*b*) Notes on thinnings prescribed in case of line sowings and suggestions to modify them.

(*c*) Notes on nursery practice–observations on the germinative power and pre-treatment of seeds.

8. *Markets.*

(*a*) Notes on the adequacy of the provision made for catering to various local markets.

(*b*) Prices of firewood and small timber in various markets.

9. *Summary of revenue and expenditure.*

A summary of revenue and expenditure in such a form as will facilitate comparision with the financial forecast made in the working plan.

CONTROL JOURNAL FOR THE EUCALYPTUS HYBRID WORKING CIRCLE.

1. *Growing stock.*

Notes on the growing stock in the various felling series.

2. *Factors influencing the crop.*

   (*a*) Climate.
   (*b*) Animals.
   (*c*) Insects.
   (*d*) Fungi.
   (*e*) Fire.
   (*f*) Man.

3. *Exploitation.*

   (*a*) Notes on the suitability of the present division into felling series.

   (*b*) Notes on the adequacy of the output of firewood.

   (*b*) Notes on the suitability of the method of working prescribed.

   (*c*) Notes on contractors' and labour supply.

4. *Measures of improvement.*

   (*a*) Remarks on the results of closure to grazing with suggestions about possible modifications.

   (*b*) Suggestions for the improvement of communications and export routes.

5. *Artificial regeneration.*

   (*a*) Detailed comments on the success or failure of the regeneration measures prescribed with reasons.

   (*b*) Suggestions for improvement or modifications of technique.

   (*c*) Notes on the merits of *kumri* cultivation with relative merits of the different *kumri* crops.

6. *Subsidiary silvicultural operations.*

   (*a*) Notes on the weedings and tendings proposed and suggestions to modify them.

   (*b*) Notes on nursery practice–observations on seeding, germinative power and pre-treatment of seeds. Particular reference should be made on the subject of hybridisation.

7. *Markets.*

   (*a*) Notes on the adequacy of provision made for catering to various local markets including industrial requirements if such demands arise later on.

   (*b*) Prices of firewood in local markets.

8. *Summary of revenue and expenditure.*

   A summary of revenue and expenditure in such a form as will facilitate comparison with the financial forecast made in the working plan.

CONTROL JOURNAL FOR THE IRRIGATED TEAK PLANTATION WORKING CIRCLE.

1. *Growing stock.*

   (*a*) Notes on the growing stock in the forests proposed for conversion.

2. *Factors influencing the crop*

   (*a*) Climate.
   (*b*) Animals.
   (*c*) Insects.
   (*d*) Fungi.
   (*e*) Fire.

3. *Exploitation.*

(*a*) Notes on the suitability of the present division into series.

(*b*) Notes on the suitability of the method of working prescribed.

(*c*) Notes on contractors' and labour supply.

4. *Measures of improvement.*

(*a*) Remarks on the results of closure to grazing with suggestions about possible modifications.

(*b*) Suggestions for the improvement of communications.

5. *Artificial regeneration.*

(*a*) Detailed comments on the success or otherwise of the regeneration measures prescribed.

(*b*) Suggestions for improvement or modifications with particular reference to watering regime and methods of irrigation adopted.

(*c*) Notes on the relative success attained with each of the secondary species, viz., *Eucalyptus* hybrid and *Terminalia tomentosa* in patches unsuitable for teak.

(*d*) Notes on the merits of *kumri* cultivation with relative merits of the different *kumri* crops.

6. *Subsidiary silvicultural operations.*

(*a*) Notes on the weedings and tendings proposed and suggestions to modify them.

(*b*) Notes on nursery practice—observations on seeding, germinative power and pre-treatment of seeds.

(*c*) Notes on the thinnings prescribed and how they work.

(*d*) Notes on conversion and sale of thinned produce.

7. *Markets.*

(*a*) Comments on prices obtained for the sale of the existing stand.

(*b*) Prices of firewood in local markets.

8. *Summary of revenue and expenditure.*

A summary of revenue and expenditure in such a form as will facilitate comparison with the financial forecast made in the working plan.

CONTROL JOURNAL FOR THE REHABILITATION WORKING CIRCLE.

1. *Growing stock.*

(*a*) Notes on the growing stock in the forests proposed for rehabilitation.

2. *Factors influencing the crop.*

(*a*) Climate.

(*b*) Animals.

(*c*) Insects.

(*d*) Fungi.

(*e*) Fire.

(*f*) Man.

3. *Measures of improvement.*

(*a*) Remarks on the results of closure to grazing with suggestions about possible modifications.

(*b*) Suggestions for the improvement of communications.

4. *Artificial regeneration.*

(*a*) Observations on the extent of natural regeneration of various species.

(*b*) Observations on the seeding of useful species, time of seeding, etc.

(c) Detailed comments on the sucess or failure of the regeneration measures prescribed with reasons.

(*d*) Suggestions for improvement or modification of techniques adopted.

(*e*) Notes on the relative success attained with the various species attempted to be introduced, with particular reference to exotics tried, if any.

5. *Subsidiary silvicultural operations.*

(*a*) Notes on the weedings and cultural operations prescribed and suggestions to modify them.

(*b*) Notes on nursery practice—observations on seeding, germinative power and plant per cent of seeds of various species.

6. *Summary of expenditure.*

A summary of expenditure in such a form as will facilitate comparison with the financial forecast made in the working plan.

CONTROL JOURNAL FOR THE BAMBOO WORKING CIRCLE.

1. *Growing stock.*

(*a*) Notes on the relative distribution of bamboo clumps in each of the felling series.

2. *Factors influencing the crop.*

(*a*) Climate.
(*b*) Animals.
(*c*) Insects.
(*d*) Fungi.
(*e*) Fire.
(*f*) Man.

3. *Exploitation.*

(*a*) Notes on the suitability of the present division into felling series.

(*b*) Notes on the suitability of the method of working prescribed.

(*c*) Notes on contractors' and labour supply.

(*d*) Notes of the quantity of bamboos removed classwise.

4. *Measures of improvement.*

(*a*) Remarks on the conduct of fire-protection operations and their results, with suggestions as to possible modifications in lay-out.

(*b*) Suggestions for the improvement of communications and export routes.

5. *Flowering.*

Observations on the extent of flowering—whether sporadic or gregarious and species effected.

6. *Regeneration.*

Observations on the extent of natural regeneration of bamboo following flowering.

7. *Markets.*

(*a*) Statements of prices realised from the several felling series and comments.

(*b*) Notes on the adequacy of provision made for catering to the local markets including the paper mill at Pallipalayam.

(*c*) Prices of different classes of bamboos in the local markets.

8. *Summary of revenue and expenditure.*

A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

CONTROL JOURNAL FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

1. *Growing stock.*

Notes on the different items of minor forest produce available in the division.

2. *Factors influencing the crop.*

(*a*) Climate.
(*b*) Animals
(*c*) Insects
(*d*) Fungi
(*e*) Fire.
(*f*) Man.

3. *Exploitation.*

(*a*) Notes on the suitability of the present division into units.

(*b*) Notes on the suitability of the methods adopted by lessees and the Hill Tribe Co-operative Societies in collecting minor forest produce.

(*c*) Notes on lessees and on the labour supply.

(*d*) Notes on units worked departmentally on account of lack of demand as also specialised items like camphor and *Rauwolfia*.

4. *Measures of improvement.*

(*a*) Suggestions to improve the exploitation of minor forest produce hitherto untapped, if any.

(*b*) Suggestions for the improvement of methods of collection adopted.

(*c*) Relative success or otherwise in the introduction of avenue trees and farms of Tamarind.

(*d*) Relative success or otherwise in the introduction of *Rouwolfia* farms.

5. *Markets.*

Statement of prices of various minor forest produce in the local markets.

6. *Summary of revenue and expenditure.*

A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

CONTROL JOURNAL FOR THE SECTION ON GRAZING.

1. Annual abstracts of grazing permits issued by villages. The following headings are suggested :—

   (*a*) Year.
   (*b*) Name of village.
   (*c*) Number and description of permits issued.
   (*d*) Number and description of permits issued during the previous year.
   (*e*) Reasons for increase or decrease.

2 Notes on the suitability or otherwise of the agency of collection employed.

3. Notes on the suitability or otherwise of the grazing year adopted.

4. Notes on the efficacy of closure to grazing—

   (*a*) Burnt areas.
   (*b*) Areas closed for silvicultural reasons.

5 Notes on the desirability of closure to grazing of areas specified in the working plan.

6. Notes on the desirability or otherwise of permitting penning with particular reference to the damage caused to wild life.

7. Statement of revenue and expenditure to facilitate comparison with the financial forecast made in the working plan.

APPENDIX VIII.

STATEMENT SHOWING THE NAMES OF DISTRICT FOREST OFFICERS WHO HELD CHARGE OF COIMBATORE SOUTH FOREST DIVISION.

Serial number.	*Name of officer.*	*Period.*
(1)	(2)	(3)
1.	A. Wimbush, I.F.S.	1st July 1919 to 24th February 1920.
2.	E. M. Crothers, I.F.S.	25th February 1920 to 1st April 1920.
3.	J. S. Scot, I.F.S.	2nd April 1920 to 26th October 1920.
4.	W. G. Dyson. I.F.S.	27th October 1920 to 4th May 1923 (except for 22 days in February 1922 when C. Dupre Thornton, District Forest Officer, Coimbatore North Division was in additional charge of current duties).
		5th May 1923 to 7th July 1924.
5.	M. F. Bridge, I.F.S.	8th July 1924 to 23rd March 1925.
6.	J. D. Conolly, I.F.S.	24th March 1925 to 16th November 1925.
7.	R. S. Browne, I.F.S.	17th November 1925 to 20th October 1930.
8.	J. M. Sweet, I.F.S.	21st October 1930 to 21st December 1933.
9.	D. Mc. D. Currie, I.F.S.	22nd December 1933 to 15th July 1935.
10.	M. F. Bridge, I.F.S.	16th July 1935 to 22nd November 1935.
11.	W. C. Hart	23rd November 1935 to 31st January 1936.
12.	H. P. Ward, I.F.S.	1st February 1936 to 17th February 1936.
13.	M. C. Chandy (Extra-Assistant Conservator of Forests in additional charge).	18th February 1936 to 30th March 1938.
14.	H. P. Ward, I.F.S.	31st March 1938 to 7th August 1938.
15.	J. A. Master, I.F.S.	8th August 1938 to 4th October 1938.
16.	P. Govinda Menon (Extra-Assistant Conservator of Forests in additional charge).	

APPENDIX VIII—*cont.*

STATEMENT SHOWING THE NAMES OF DISTRICT FOREST OFFICERS WHO HELD CHARGE OF COIMBATORE SOUTH FOREST DIVISION.

Serial number. (1)	*Name of officer.* (2)	*Period.* (3)
17.	D. Mc. D. Currie, I.F.S.	5th October 1938 to 4th December 1940.
18.	H. E. Brown, (Assistant Conservator of Forests in additional charge).	5th December 1940 to 2nd January 1941.
19.	D. Mc. D. Currie, I.F.S.	3rd January 1941 to 4th April 1941.
20.	B. K. Roy, I.F.S.	5th April 1941 to 7th August 1944.
21.	K. P. Chathu Nair (Assistant Conservator of Forests in additional charge).	8th August 1944 to 29th August 1944.
22.	B. K. Roy, I.F.S.	30th August 1944 to 10th March 1945.
23.	S. Ramachandra Ayyar, (Assistant Conservator of Forests in additional charge).	11th March 1945 to 23rd July 1945.
24.	B. K. Roy, I.F.S.	24th July 1945 to 7th March 1946.
25.	J. S. Rowland (Assistant Conservator of Forests in additional charge).	8th March 1946 to 21st July 1946.
26.	J. E. M. Mitchell, I.F.S.	22nd July 1946 to 11th September 1946.
27.	N. S. Ayyanna (Assistant Conservator of Forests in additional charge).	12th September 1946 to 24th November 1946.
28.	J. E. M. Mitchell, I.F.S.	25th November 1946 to 1st April 1947.
29.	P. Madhavan Nair, (Assistant Conservator of Forests in additional charge).	2nd April 1947 to 30th June 1947.
30.	K. T. Mathew, I.F.S.	1st July 1947 to 18th April 1948.
31.	P. Madhavan Nair	19th April 1948 to 2nd June 1948.
32.	M. S. Rangaswamy	3rd June 1948 to 31st November 1951.
33.	K. Karunakaran Nair, A.I.F.C.	1st November 1951 to 22nd August 1952.
34.	K. Shunmuganathan, A.I.F.C. (Assistant Conservator of Forests in additional charge).	23rd August 1952 to 4th September 1952.
35.	A. M. Mahmood Hussain, A.I.F.C.	5th September 1952 to 30th June 1953.
36.	K. A. Bhoja Shetty, A.I.F.C.	1st July 1953 to 29th August 1954.
37.	N. S. Ghate, I.F.S. (District Forest Officer, Coimbatore North Division in additional charge).	30th August 1954 to 11th September 1954.
38.	K. Venkatakrishnan	12th September 1954 to 4th February 1956.
39.	M. Thyagarajan, A.I.F.C	5th February 1956 to 21st June 1956.
40.	K. Venkatakrishnan	22nd June 1956 to 6th June 1957.
41.	A. Olimuthu	7th June 1957 to 18th June 1960.
42.	S. Kondas, A.I.F.C.	19th June 1960 to 7th June 1961.
43.	G. M. A. Quraishi, (District Forest Officer, Coimbatore North Division in additional charge).	8th June 1961 to 21st June 1961.
44.	A. Saldanha	22nd June 1961 to 20th December 1961.
45.	G. M. A. Quraishi (District Forest Officer, Coimbatore Central Division in additional charge).	21st December 1961 to 14th January 1962.
46.	A. Saldanha	15th January 1962 to 8th June 1962.
47.	K. Durairaj, A.I.F.C.	9th June 1962 to 2nd September 1963.
48.	J. Wilson, A.I.F.C. (Hons.) (Working Plan Officer, Coimbatore South Division in additional charge).	3rd September 1963 to 23rd September 1963.
49.	K. Durairaj, A.I.F.C.	24th September 1963 to date.

APPENDIX IX.

LIST OF MAPS APPENDED TO THE PLAN.

A. *Detailed management maps.*

Anamalai R.F.—Sheet Nos. 1 to 16	4 inches — 1 mile (1 cm.—.158 kilometre)
Mount Stuart Block—Sheet No. III	12 inches—1 mile (1 cm.— ·0528 kilometre.)
Do. Sheet No. V	Do.
Do. Sheet No. VII	Do.
Do. Sheet No. VIII	Do.
Do. Sheet No. IX	Do.
Kukkal and Kudraiyar Blocks	4 inches—1 mile (1 cm.— .158 kilometre)
Manjampatti Block	Do.
Uthiyur R.F.	8 inches—1 mile (1 cm.— ·0792 kilometre)
Dalavoipatnam R.F.	Do.
Periamanimalai and Attamalai R.Fs.	Do.

B. *Range management maps.*

Pollachi, Tunacadavu and Punachi Ranges	1 —1 mile (1 cm. — ·631 kilometre)
Udumalpet Range	1 — 1 mile (1 cm. — ·631 kilometre)

C. *Divisional map.*

Key map of Coimbatore South Forest Division	1 — 4 miles (1 cm. — 2.535 kilometres)

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GOVERNMENT OF TAMIL NADU
1972

MISCELLANEOUS

PROCEEDINGS OF THE CHIEF CONSERVATOR OF FORESTS, MADRAS-6

Proceedings Mis. No. 186, dated 21st January 1967

Subject.—Working Plan—Coimbatore South Division—For the period 1st April 1965 to 31st March 1975—Sanctioned.

THIRU T. JEYADEV, I.F.S.,
Chief Conservator of Forests.

Proceedings Mis. No. 186, dated 21st January 1967.

Sanctioned.

T. JEYADEV,
Chief Conservator of Forests.

To the Conservator of Forests, Coimbatore Circle.

Copy to the District Forest Officer, Coimbatore South Division.
„ Conservator of Forests, Working Plan Circle.
„ H-1.
} With a typed copy of the sanctioned working plan.
„ Librarian with a typed copy of the sanctioned working plan for taking action on the printing.